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NEWS IN BRIEF

Over-ordering hits CA

MASSIVE over-ordering of some stocks and shortages of others are the main reasons given by Computer Automation for the loss that the company expects to make in its financial year which ends on July 1. A company spokesman said that significant management changes had been made in the US as a result of these problems.

He added that this year had been poor everywhere for CA with turnover in Europe only up by 25% when it should have been 50% higher than the previous year.

TT races score

THE Univac 90/30 which handles all the Isle of Man government's DP requirements was called into service to provide the timing and lap-marking for the world famous Manx TT motor-cycle races. The software was written by Univac and data was entered into results displayed on Uniscop VDUs around the track.

Profits up 74%

RECORD revenues and profits have been reported by Mohawk Data Sciences, MDS, for the financial year to the end of April. Revenues rose by 17 per cent from \$152.6 million to \$178.2 million. More encouraging still was a rise in profits from \$5.5 million to \$9.6 million, an increase of 74 per cent. Earnings per share rose from 72 cents to \$1.10.

COMPUTER WEEKLY

Surprise marketing move by Apple

IN a sudden change of marketing policy, Apple Computer, through its European marketing arm, Eurapple, has appointed Data Efficiency of Hemel Hempstead, as master distributor for the UK. As from June 20, Data Efficiency is the sole importer of Apple Computer products into Britain.

The move has surprised existing distributors none of whom received any communication from Eurapple about the impending change. The first they heard was when Data Efficiency contacted them last week to offer sub-distributorships.

Negotiations are now going on with the companies concerned, Personal Computers, range through its Microsense offshoot. It has

Keen Computers and Lynx Computers. They could provide Data Efficiency with healthy business. Personal Computers managing director, Mike Sterland, said last week that his June sales were over £150,000, and growing. Keen Computers sales were around £50,000 this month.

Orders already placed by the distributors to meet projected sales are to be honoured by Apple. Keen has six months' worth totalling about £750,000, while Personal Computers has two months to come.

Data Efficiency will be selling the Apple range through its Microsense offshoot. It has

been appointed because it was able to meet criteria for master distributorship. These include, according to an Apple statement, strong financial resources, and the provision of sufficient software and hardware support capabilities.

Mike Brewer, managing director of Data Efficiency, said his company, with an annual turnover of some £2.5 million last year, was investing about £500,000 in stock, and intended to maintain stock levels at that figure in the future.

Personal Computers now has its lawyers considering its position following Apple's move.

\$630m leasing writ for Lloyds

LLOYDS of London and 57-Lloyds underwriters are being sued for a total of \$630 million by Federal Leasing of McLean, Virginia, one of the original third party lessors in the US to use the controversial Lloyds "J" policy for insuring the residual value of IBM mainframes.

A spokesman for Federal Leasing told Computer Weekly that the \$630 million included \$27 million worth of claims under "J" policies that had not been paid, and that the rest was for damages.

Federal is charging the underwriters with allegedly abusing their obligation under the "J" policy and with allegedly jeopardising Federal's reputation in the leasing business.

He explained that Lloyds had paid \$11 million to Federal in claims over a period that started about two years ago, but that nine months ago Lloyds stopped paying any more claims. It had given no explanation.

He said that Federal was now losing money and that the company was "in peril". It had lost a lot of new leasing business.

Federal was one of the earliest users of the "J" policy starting in 1974 and the original value of the machines covered was well over \$100 million.

The original value of all the machines covered by "J" policies has been estimated at considerably more than \$1,000

million, the biggest single user being ITEL.

Loss adjusters have already calculated that it could cost the underwriters well over \$200 million if they have to pay out on all the claims.

They stopped writing new "J" policies on IBM processors late in 1977 (CW, December 8, 1977) after the announcement of the low-cost IBM 303X machines which drastically affected the residual value of leased 370s.

The "J" policy was used overwhelmingly by US-based lessors, and one of the few European users, Promodata, does not envisage having to make any claims because the residual values it assigned to the machines it covered were all low — no more than 10% on any CPU according to the company.

In contrast, some of the US-based leasing firms that used "J" policies assigned residual values as high as 50% to machines that they wrote leases on three or four years ago. The machines are now being returned by their original lessees and are realising as little as 25% when they are remarketed, hence the massive claims on Lloyds.

Funding of Project Gamma

AS a final venture before its role is absorbed by other government schemes, the DoI's Advanced Computer Technology Project is to fund a further phase of Software Science's Project Gamma.

Nexos deal settled in principle

AGREEMENT between Nexos and Muirhead over selling facsimile equipment for office systems is "very close now," according to Nexos managing director

Muir Moffat. He told Computer Weekly that the deal (CW, May 17) was settled in principle and now just the legal nitty-gritty is being sorted out.

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Row over plans to split PO's DP section

A ROW broke out last week between Post Office unions and the Post Office over plans to split up its DP section as from next month.

Further strike action (CW, June 21) was taken at a number of PO centres by members of the Society of Civil and Public Servants, and the Civil and Public Servants Association.

On Friday, 90 operators were called out at the St Albans, Herts, centre, where an ICL System 4 is used to run postal and commercial applications, and to provide an online service to PO development centres.

Other sites hit by the action included the Giro centre at Bootle and centres at Cardiff, the Barbican in London, and Docos House, where about 400 systems and programming staff are employed. These centres have now returned to work.

The action came at a time when the Post Office pay and grading dispute was in its 11th week, with the telephone billing backlog at some £500 million.

The PO plans, as outlined in a letter to the Council of Post Office Unions last week, include the following points of contention:

- The setting up of a Data Processing Executive to handle the computing requirements of the PO's telecommunications branch; and
- The Giro centre in Bootle becoming part of the National Giro Bank.

Racal success at Milgo

SHOWING that it has not lost the magic touch, Racal has not only doubled turnover to over \$80 million at Milgo Corp in the two years since it bought the US modern manufacturer, but enhanced profitability to the point where it approaches the 27% on sales achieved by the Racal group as a whole.

Overall, in the year to March 31, Racal made pre-tax profits of £81.8 million, up 23.7% on turnover up 23.6% at £228.7 million.

Racal said that it would be interested in acquiring the National Enterprise Board's 50% stake in Ferranti (CW, June 7). Ferranti's figures, also to March 31, are decidedly dull, with profits up only £800,000 on last year's £9.1 million, although turnover was up 22% at £102.1 million.

Profits were hit by a loss at

Canadian subsidiary Ferranti-Packard. Underlining Ferranti's position as UK number two in computers, the computer systems division made profits of £4.3 million, up 43%, on turnover of £57.8 million, up 25%.

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Briefing 4300 delay in Germany

GERMAN customers for IBM's 4300 line are infuriated because they still have not been given a delivery date for the machines, although customers in the UK and Italy know where they come in the delivery ballot, and first shipments have already begun (see back page).

Particularly galling to users in West Germany is the fact that the 4300s are built in their country for the European market. The uncertainty has caused prices for used 370/138s to harden considerably in Germany. IBM says that its customers there will be given delivery dates shortly.

PDP-11 packs

A DATABASE management system and two application packages for DEC PDP-11 machines running under RSTS/E have been launched by Comtech Ireland, a subsidiary of the Toronto-based Comtech Group International. Called Sage, the DBMS is written in Macro-11. The application packages, written in Basic Plus, comprise Creditmaster, a sales analysis system, and Sales Success, a marketing information system.

Copyright writ

A HIGH Court writ is understood to have been issued by Safe Computing alleging breach of contract and breach of copyright by a former employee. If, as seems likely, the case comes to court, it will be the first case involving software copyright to be heard by an English court.

Abandoned

THE proposed joint venture between Plessey Semiconductor and General Instrument Microelectronics of the US has been abandoned. With the appointment of Dr Melvin Larkin, previously chairman of Motorola (UK), as head of its components division, Plessey is now preparing to go it alone in the semiconductor business.

£100,000 raid

FOLLOWING a £100,000 raid on the National Westminster Bank in Small Heath, Birmingham, the Banking Information Service, which is a collective spokesman for the "Big Five" banks, has called for money to be transferred on paper or by EFTs. A spokesman said that there was always the risk of computer fraud but in such cases "people don't get hurt".

Briefcase micro

WORKING with Allied Breweries, Raytheon's UK subsidiary Data Logic has developed a portable microcomputer the size of a briefcase. It has been designed for use as a production control system, though development work is continuing to produce a general purpose machine. Full story in Micro News, Page 14.

'Be brave' call to employers

EMPLOYERS need to be encouraged to be brave. That is how John Hackett, head of the BCS Specialist Group for the Disabled, succinctly summed up the employment of disabled people.

The spoke of the increasing number of ways in which computing applies to the disabled. On the other hand, microcomputers were making it possible for more people to work in computing even if they are housebound, while at the same time the use of computers as aids allowed the disabled to work in many other fields.

The specialist group's aim is to develop employment possibilities for the disabled in computing.

Representatives of government departments and of organisations for the disabled were among guests at a lunch at BCS headquarters in London last week, which marked the chairman's taking office.

A range of electronic aids for the disabled was exhibited, including Mavis, seen in our picture, a microcomputer-based device.



Leo DME points the way for ICL

UNDERLINING the power of ICL's microcoding techniques in expanding the potential customer base for the 2900, the company is developing a DME emulation of the aged Leo 326 machine.

Understood to have been developed especially for the Post Office under a contract worth over £1 million, DME/326 is expected to join DME/1900 and DME/System 4 on the 2980. It will enable the Post Office to run its regional telephone billing and payroll applications on modern hardware.

The Post Office Data Processing Service still has seven of the English Electric Leo-Marcconi Leo 326 machines handling these applications, and has been

seeking the most cost-effective way of continuing the present decentralised processing. Commissioning ICL to write the necessary microcode to enable them to run on 2900s proved the most appropriate.

This is the second time that the Post Office's requirements have caused a major effort to be devoted to Leo machines. In the late 1960s, the Leo 320 production line was specially reopened because the Post Office wanted more Leos.

DME/326 is unlikely to be of much value to ICL, because there is only a handful of Leo machines still in service around the world. The significance of the development is to underline the ease and low cost which

would be involved in writing DME emulations for the machines of many of ICL's competitors.

ICL is non-committal about whether it intends to use new DMEs to spearhead raids on the installed bases of its competitors. "We are doing a lot of work to ensure an increasing share of the market, including going from competitors, and are constantly reviewing our product strategy to meet our growth objectives," ICL told Computer Weekly earlier this year, adding that it had no comment to make on the possibility of DME for competitors' machines (CW, March 8).

The most obvious candidate is clearly DME/370, and it would be surprising if ICL does not already have such an emulation running experimentally. Since 2800 is a 32-bit machine, it would also be easy to do DMEs for the Univac 90 series, and the Siemens 7700 line, both of which are descended directly or indirectly from the RCA Spectra 70. System 4, for which DME is already available, was little more than the Spectra 70 built under licence by English Electric.

INSIDE THIS WEEK'S CW.....

BLURRED BOUNDARIES

As with most other areas of the computing game, the micro has made significant changes to the peripheral and terminal market. The power with which these devices can bring equipment that was previously a mere appendage to a system, has blurred the boundaries between processor and peripheral. This week's special section looks at some aspects of the peripheral and terminal market. Pages 17/20

PALACE BOUND

The swarming and straining in the host is over and throughout the country this year's Computexata is taking place. We are presenting the final Crystal Palace as the end of September. The last finalists were sorted out on Saturday. Page 23

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JOB OPPORTUNITIES: PAGES 24-55

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More UK motor firms go to Amdahl

CONSOLIDATING its position as a major supplier to the UK and world motor industries, Amdahl has just announced two UK orders for the large-scale 470V/7 mainframe.

The customers are BL Systems and Massey Ferguson, which join Ford, Rolls Royce and Chrysler as Amdahl users in the UK. Chrysler and associated companies also have Amdahl machines in France and the US, while Ford has 470s in Germany and the US.

The 8 Megabyte 470V/7 at BL Systems replaces two IBM 370-158s and will run alongside an IBM 3033 at the company's Redditch computer centre, providing remote batch time sharing and IMS online services to the Austin-Morris, Jaguar, Rover-Triumph, and BL Components divisions.

Massey-Ferguson Holdings has chosen a 32 Megabyte 470V/7 for its new European Data Centre in Birmingham, where it will handle extensive online teleprocessing and general DP applications.

Itel may sell DP division

AN announcement by Itel last week that second quarter losses could amount to £10 million, due entirely to losses in the Data Products Group, has given rise to speculation that the division may be sold. The company is due to meet its principal bankers today (July 5), after which an announcement is expected.

If the Itel computer operations were offered for sale, acquisition by Hitachi would give the Japanese manufacturer a short-cut into the US and European markets.

Siemens and Philips step up bids for personal market

PHILIPS is plunging into the personal computer market with its C7000 Videopac Computer, due in the shops this week at about £150, and aims to sell 150,000 units this year.

Siemens is expected to follow suit later this month, although in a higher price bracket, with its

PC100 priced at about £600. This is designed as much for process control and commercial applications as for personal use.

Philips is building on the television games market and aims to make it easy for people

● Turn to page 15

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COMPUTERVIEW

LIKE it or not, computer staff are increasingly being drawn into industrial disputes as the shock troops of organised labour.

Trade unions have come to realise that pulling out large numbers of their members on strike can be counter-productive. After all, those pulled out will expect strike pay — with the inevitable drain on union funds; the strikers may become disillusioned if the dispute drags on — and swallows up the initial benefits of any pay rises that may be achieved; and the more militant may start taking things into their own hands, weakening the solidarity that trade unionism is supposed to be all about.

Far better then, to identify a small group of employees who, by withdrawing their labour, can have a disproportionate effect on the organisation for which they work. Computer staff fall neatly into this category and growing use is being made of the power such concentrations of skills provide.

A prime example is the 10-week dispute at the Post Office, where according to chairman Sir William Burrows, a small number of people have been able to damage the national economy. Computer operators have been brought into the dispute, and the effect so far has been to hold up the despatch of telephone bills worth £500 million. As a result, the Post Office is having to bor-

The price of power

row money to pay staff wages, with interest charges according to Sir William, so far amounting to £35 million, which will have to be passed on to the public in the form of higher charges for Post Office services.

"I'm very concerned at the situation where a small number of people are being paid to stay at home and the result is damage to the organisation," said Sir William. "It is more economical than an all-out strike, and it does not cost the union anything."

"I think it is time national attention was drawn to the damage done to the economy by low-key, small, highly selective industrial action."

Operators and supervisory staff at the VAT computer centre in Southend were chosen to strike on behalf of the members of two Civil Service unions earlier this year, and again, the action of a handful of people was disproportionately effective.

It is very noble of computer people to put themselves in the

front line in this way to benefit their less powerful brothers and sisters, but in the medium term, their willingness to be the cannon fodder in big disputes is certain to rebound on them.

Already computers are regarded almost negatively by the public, being considered variously as instruments of Big Brother, purveyors of monstrous gas bills and uninformative bank statements, and as a major threat to employment.

When, increasingly, phones do not fly, social security benefits do not get paid, and it proves impossible to withdraw National Savings, blame for all the chaos will, in all probability, fall on "computer people."

Operators are, of course, the people most vitally involved, because the effects of a strike of operators are immediate. However, the disruption which can be caused by programmers and analysts going on strike is rapidly increasing as organisations depend more and more on

the computer department.

Individuals clearly have to make up their own minds whether or not they want to serve their fellow workers in this way, but it is something to which they should devote considerable thought.

In the same way that the worker sells his labour to the highest bidder, should not computer people additionally sell their support to the highest-bidding trade union? After all, they deserve compensation for taking the load.

On the other hand, they can instead pay heed to the growing pressure, strong within the present government, for groups of workers vital to the national economy and the safety and welfare of the public, to be paid a premium in return for a legally-binding agreement not to withdraw their labour in pursuance of an industrial dispute.

The increasing involvement of computers in almost every aspect of the national economy confers enormous power on the individuals who work most closely with them.

The majority of people who work in the computer industry are individualists, and there is nothing more boring than to be told one must "stand up and be counted."

But that is one of the unavoidable penalties which go with the privilege of power.

Canal control

WITH the installation of a £250,000 Burroughs B2810 system, the British Waterways Board is hoping for improved control over its 2,500 miles of canals in Britain. The B2810 replaces a Honeywell 125 machine and features 250K of main memory, 280 Mbytes of disc storage, a B874 data communications processor and two TD 830 VDUs.

Faster packing

with ICL
A B Packing of Coventry achieving a much faster turn round of goods since the installation of an ICL 1503 series computer equipped with three VES Valued at £200,000 the system handles payroll, stock control, invoicing, estimates and times and orders. Forwarding has also been implemented.

Ten years ago...

COMPUTER WEEKLY
JULY 3, 1969

THE first document read from ICL to have OCR elements passed their site visit and would come into operation in the year at the Department of Health and Social Security. . . . With about £1 million spent and 32 new computers installed or on order, the work of the Computer Society, Universities and Research Councils had shown considerable progress since it started, opening in September, 1968. But the programme was running three years behind schedule. . . . Former IPC development director Stafford Beer was appointed the first Professor of Cybernetics at Manchester University. . . . RCA announced in the US that it was withdrawing its software, though not its hardware, from IBM in previous week. . . . The Royal Radar Establishment, Malvern, started work on the development of an Algor 88 computer to replace the ICL 1900 series.

York centre mooted to co-ordinate work on Ada

THE University of York has asked the Science Research Council for £500,000 to fund a software technology centre to co-ordinate UK work on Ada. It expects a reply to the proposal in the autumn.

According to the head of the University's Computer Department, Professor Ian Pyle, the centre would concern itself chiefly with the Ada programming environment, the requirements for which are currently laid down in the US DoD's Pebbleman specifications.

It would also be responsible for developing Ada teaching materials and running training courses in the language.

Unlike Ada compilers, Pyle noted, program development aids were likely to be written by many UK groups, including software and system houses. It would be sensible for UK efforts in this field to be co-ordinated.

The proposals, he said, also included using the Post Office Packet Switched Service (PSS) to disseminate information on projects underway, much in the same way that the DoD used Arpanet in the US.

PSS could also be used to make finished tools available to users.

US work on Pebbleman is generally thought to be less well advanced than on the language itself, with many of the facilities identified by the document still only loosely defined.

However, the importance attached to the programming environment has already prompted the UK Ministry of Defence to

initiate work in the area, notably by letting a joint contract to SDL and Software Sciences earlier this year (CW, May 17).

While agreeing with the need for a UK co-ordinating centre, industry sources were surprised at the York Initiative, seeing the MoD as the most likely source to fund such a centre, and an MoD establishment such as RSRE or ASWE as its most likely home.

The Ada test translator written by CII-Honeywell Bull in PL/I has been mounted on the Multics systems at MIT and at Honeywell's Research and Development Centre at Minneapolis. It can be accessed at both sites via Arpanet, and at MIT is also accessible to Tymnet and Telenet users. Computer time can be purchased directly from either MIT or Honeywell.

The Times expected to publish again soon, while talks continue

TALKS between management and unions at The Times have started again this week on a fresh basis, following a personal intervention by Lord Thomson.

At a meeting last Friday with Joe Wade, general secretary of the National Graphical Association, it was agreed to defer settlement of the most thorny issue of all, the operation of new equipment, and concentrate on finding a solution to the other outstanding problems such as disputes procedures and over-manning, so as to restart publication as soon as possible.

It was also agreed that joint talks on new technology would go ahead while the papers continue to be produced on the old equipment, and that a solution would have to be found within one year.

The talks this week, between managers and local union officials, are intended to settle the procedure to be followed in the negotiations, and what will happen if no agreement can be found.

Plenty of stumbling blocks

remain, particularly with the clerical and press operators' union, Naisopa, which has been insisting on reinstatement of all its staff before talks. One Naisopa official predicted the union would stick to this condition.

The prospects of a re-opening of The Times look brighter than since the close-down last November, though they are by no means certain. What will happen over the issue of direct input by journalists is even more problematical, but one senior trade unionist, unconnected with the dispute, forecast that the NGA would be forced to admit within a year the inevitability of direct input, and that the problem would be solved by an amalgamation of the NGA and the NUJ.

The significance of this latest agreement is that while no substantive settlement has been reached, Times management has dropped its insistence that all outstanding problems be solved before publication resumes.

Saving them with a mini

WHY should the devil have all the best computers? The first 8008-bit-built Honeywell Level 8/43 minicomputer is on its way to the Salvation Army's International distribution and trading organisation, Salvationist Publishing and Supplies, in London.

The £41,000 Level 8/43 system is being installed by Computer Factors of Coventry and will handle accounts, orders, stock, subscriptions and mailing.

Pay row puts Post Office in chaos

POST OFFICE operations remain in chaos this week after a series of unsuccessful meetings, threats of suspensions, and union refusals to co-operate with a corporation merger plan (CW, June 28) forced the way to a satisfactory end to the protracted pay dispute.

For the last 12 weeks members of the Society of Civil and Public Servants and the Civil and Public Servants Association have been fighting for increases of up to 20%. They have blocked telephone bill payments of over £550 million and forced the Post Office to take out loans of about £8.5 million a day.

By rejecting an offer of 9% plus 3.5% to 7% for regrading, the 124,000 strong Post Office Engineering Union has entered the

scene, adding further weight to the SCPS and CPSSA demands. No decision to strike has been taken by the POEU as yet, however.

In a separate issue, both the CPSSA and SCPS have voiced their discontent over the Post Office plans to split up its DP section. These plans went into effect this week.

The major revisions have been the setting up of a Data Processing Executive to handle the computing requirements of the telecommunications branch, and a merger of the Giro Centre in Bootle with the National Giro Bank.

Union members at Bootle have refused to go along with the idea and are handling only normal Giro processing and

keeping to an overtime ban introduced at the beginning of the pay dispute.

"We are taking this action even though the threat of suspension at any time hangs over our heads," said one CPSSA member at the centre.

Racal-Milgo's way ahead in multiplexing

Five bank centres hit

ALTHOUGH some delays will be experienced by customers waiting up-to-date statements of account, the Midland Bank has said that the one-day strike planned by 800 computer staff for July 9 will have no long-term effects.

Five computer centres, at Bootle, Brent, Putney and London, will be hit by the action, which is part of a bid by the Banking, Insurance and Finance Union (formerly the National Union of Bank Employees) to

win pay increases of 20% plus a further 5% for productivity.

A bank offer that averages out at 12% has already been rejected.

A BIFU spokesman commented that although the July 9 strike was definitely a one-day event, the prospect of further action could not be ruled out.

The union is already carrying out a ballot of high-street banking staff in case second line action becomes necessary.

Plessey, Byte Shop deal

A RANGE of DEC business systems put together by Plessey Peripheral Systems are now to be available retail, following the signing of an agreement between Plessey and the Byte Shop chain.

The Plessey systems will make use of a range of business applications packages written by Computer-Aided Systems, the Byte Shop's sister company. It is expected to produce about £1.5 million in additional sales to the retail chain.

The agreement is being formally signed by Bill Cannings, Byte Shop managing director, and Mike Brisland, general manager of Plessey Peripheral Systems, at the Microcomputer Show at the Bloomsbury Centre Hotel in London, which opens today (July 6).

For its shops outside central London, the Byte Shop is changing its name. These shops will now be known as Computerland, a name more easily understood by non-computer people.

Designed for the quiet office

QUIETNESS of operation is one of the striking features of the Context 201 office OCR machine, now being marketed in the UK by Lexitype. The reader is made by Context Corp of Burlington, Massachusetts, and was recently acquired by Lexitype as part of the machine maker's bid to get into office systems.

Intended as an input device to a word processor, the 201's low noise level makes it particularly suited for use in offices. It accepts OCR B typing, and can read 280 A4 pages an hour, fed from a hopper. The word processor is connected via a standard RS232C interface.

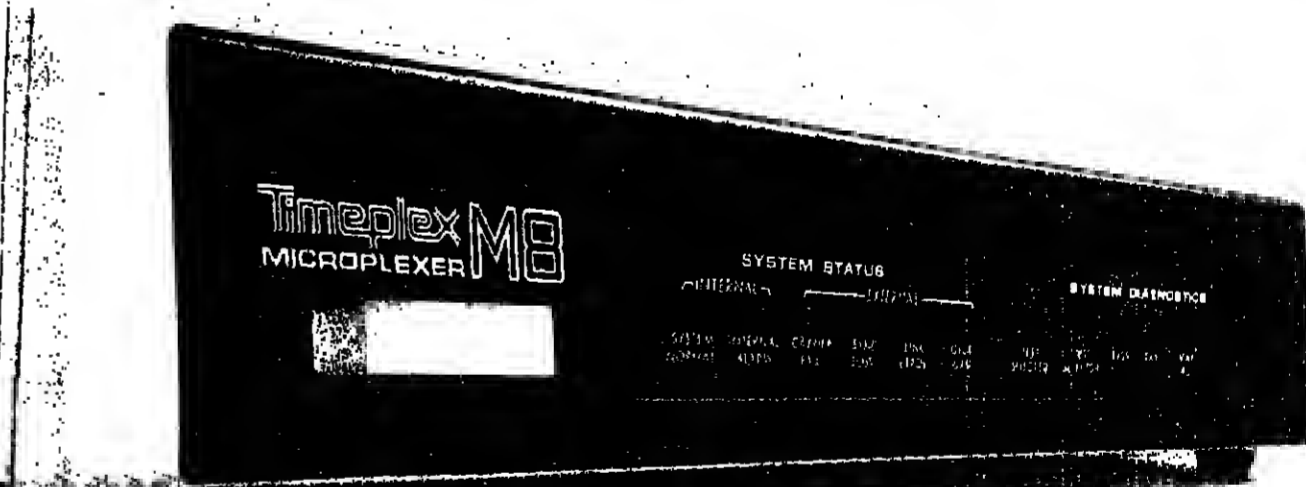
Lexitype can also supply a complete WP system with editing screen, floppy discs and

printer. Special software is available with this system for conversion to other media, such as 1/4-inch magnetic tape, Telex, or phototypesetters.

The link to Telex is via paper tape. Telex messages can be composed out of standard paragraphs, in which spaces can be left for the automatic insertion of variables.

Criminal records

A TWO-YEAR plan to computerise criminal conviction records at the South Yorkshire police headquarters will soon be under way at a final estimated cost of about £400,000. The project is being handled by Data



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1984 and all that...

THIS WEEK'S example of the strange things people say in the media about computers was sent in by Philip Galt of Bath, who wins £5.

Some people may find these developments frightening. It may be feared that human beings are being replaced by intelligent machines. But the fear is premature. Even with today's advances in micro-miniaturisation a machine that possessed all the attributes of the human brain would still be no longer than a double-decker bus.

Adrian Berry in the Daily Telegraph

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Downtime

by Chad

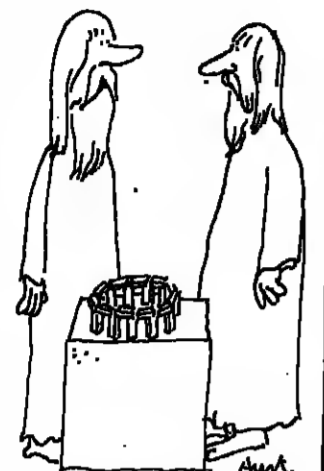
Sole-searching

THE latest bright idea for using computers to increase the sum total of human happiness comes from the Stockport Odd Feet Association. In case you are not acquainted with this organisation, I can tell you that it aims to help people whose feet are different sizes, and who therefore need always to buy two pairs of shoes, thanks to the helpfulness and consideration of shoe companies and shops that will not sell broken pairs.

The idea is to use a computer to match up people whose feet correspond, so to speak, so that they can swap shoes and thereby save lots of money. To this end the association has received a grant of £300 from Greater Manchester Council, and on what better cause could public money be spent?

The only trouble I envisage is, what happens when you go to the shoe shop with your newly acquired paw partner

and you discover that he wants to buy brogues and you had your heart set on brogue creepers? I suppose the program will have to take taste into account as well as size.



"We've miniaturised our astronomical computer."

CDC and DRI link to sell new drive worldwide

A DISC DRIVE currently under development at Data Recording Instrument is one of the products to be built by the joint manufacturing company being set up by DRI and the Control Data disc manufacturing subsidiary, Magnetic Peripherals Inc (CWI, May 3). According to DRI the new drive will be sold on a worldwide basis by DRI and CDC.

No information about the new product has been announced yet, but an 8-inch hard disc drive looks the most likely candidate, because most of the other manufacturers of small disc drives have already introduced 8-inch units.

DRI and CDC are the two major firms in this market that have not announced 8-inch drives.

The 8-inch units already available are as compact as 8-inch floppy disc drives and provide much higher capacities, but they present the serious problem of non-exchangeability of the media.



Former vice-president of engineering at MPI, Larry Matthews has been appointed managing director of the new DRI-CDC joint venture in the UK.

For that reason an 8-inch unit with a removable cartridge as well as a fixed platter could be well received by the market.

The first two products to be manufactured by the new company will be existing CDC units. These are the 9427H cartridge disc drive, which comes with

one fixed and one removable platter each holding six Megabytes, and the 9448 cartridge module drive which combines a 16 Megabyte front loading cartridge with 16, 38 or 80 Megabytes of fixed disc capacity.

Both products are already built in the US at the Oklahoma City plant of MPI, but MPI needs additional manufacturing capacity to meet the demand for the 9427H and 9448, otherwise known as the Hawk and the Phoenix.

DRI's marketing company, Data Recording Equipment, will sell both products in Europe in competition with CDC's sales force, although neither side envisages that this will create serious problems because their co-operation is in the area of manufacturing rather than marketing.

The new manufacturing company will be 78% owned by DRI and will be funded to the tune of £8 million by the National Enterprise Board which owns DRI, but MPI will exercise a high degree of control of its management.

The managing director of the new company is an MPI man, Larry Matthews, who was formerly vice-president of engineering at the MPI plant in Normandale, Minnesota. He is moving to the UK later this year.

The new company still has to name, although United Peripherals Ltd is favoured, and MPI and DRI are rather vague about the moment about its future size. DRI chairman Henry Sweetnam said that it would employ "several hundred people, maybe more" and predicted that its turnover would be £80 to £100 million within four years.

The new company will reside in a significant expansion of the DRI workforces at its two main centres at Staines and Croy, particularly the latter.

The legal obstacles to a MPI/DRI deal going through were settled some weeks ago (CW, May 31) when Industry Minister Sir Keith Joseph approved an outlay of about £1 million to buy out the 1% shareholding in DRI held by Grundy (Teddington) Ltd which had objected to the venture.

GA claims 20% fuel savings from energy management system

CAPITALISING on its experience in the numerical control, industrial automation and factory data collection markets, General Automation is promoting the concepts of total plant management, and using the growing pressure for energy conservation to spearhead its drive.

US experience has shown that computer-based energy management systems can pay for themselves in as little as six months, cutting between 10% and 20% off a company's annual bill for electricity and other forms of energy.

The approach and the savings

depend to some extent on the way the power company computes its charges, but in general it is more economical to spread the power demand evenly through the day rather than create periodic peaks.

The key elements of the system are a microprocessor-based data gathering unit, the Micro-dator, which can handle up to 544 monitor and control points, and a central minicomputer, typically a GA 16/440.

One of the Big Three car manufacturers in Detroit estimates that the system will save \$1 million on energy bills over 18 months.

As well as shedding non-critical loads during periods of peak demand and switching off things like heating, ventilation and air conditioning systems when they are not required, the system also builds up a wealth of statistics on energy use, as well as a historical record of weather patterns around the plant which can be used subsequently to fine-tune the system.

Installation of an energy management system creates something of a Trojan Horse for General Automation, for once the central computer is in place, the incremental cost of adding a host of other facilities becomes

attractive. Factory data collection terminals, time recording equipment, centrally administered process control and other facilities can run alongside the energy management software on the same computer, and the company has networking software which enables all the terminals, as well as satellite computers, to be linked together.

For the future, General Automation is working on a more advanced numerical control system than is at present available, where instead of the numerical control programs being loaded on paper tape close to the machine, programs can

be entered, modified and progress monitored from the central computer.

In anticipation of much stricter legislation on permissible working environments, environmental monitoring and control will be added.

As well as providing higher levels of plant security, access control systems can build up records on each employee, showing how much time has been spent in each part of the plant. This could be particularly valuable where an unexpected health hazard comes to light and it becomes necessary to screen employees for exposure.

Dow Jones debut

IN isolated recognition of the key role played by the computer industry in the US economy, the Wall Street Journal has added IBM to the 30 shares whose price movements are computed daily to produce the world-famous Dow Jones index. It is the first revision of the stocks making up the index for 20 years and is designed to reflect the importance of technology.

Operator in £1,976 bank fiddle

A BANK computer operator who syphoned off money from local businessmen by manipulating the computer, was "milked" customers whenever the mood took her, a Crown Court was told last week.

Christine Palmer, 22, of Basingstoke, who admitted stealing £1,976 from Barclays Bank at Basingstoke, in what was called a "deliberate and cunning fraud" was given a two-year suspended sentence.

Recorder Robert Johnson QC told her, "I feel that I am imposing a sentence that is wrong. People who take large sums and have suspended sentences are, in the eyes of the public, getting away with it."

Asbestos danger

AES WORDPLEX has been forced temporarily to stop using its warehouse in Reading following the discovery of blue asbestos material in the roof. Wordplex has coiled in a specialist firm to carry out the costly operation of removing it.

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The Mamopart portable data terminal, connected to an office terminal via the acoustic coupler.

Hand-held terminal for data capture

HAND-HELD data capture for a range of applications is the purpose of a terminal introduced into the UK last week by British Brown Boveri, a company more closely identified with the power industry.

Already in use on the Continent for about a year, the Mamopart is a portable unit based on RCA's 1802 Cesium micro and operating off an internal, rechargeable battery pack.

It demands little of the user, as the keyboard has limited functions and the user need only key in the relevant item code - for example, a supermarket product article code - which is then stored within the unit's memory.

Standard memory sizes are 1K of program and 2K of data storage, but the company says these figures can be quadrupled if required.

The Mamopart comes with an acoustic coupler and this allows captured data to be transmitted at up to 600 baud over normal telephone lines to a central processor. Data protection is said to be high (one error in every six months of operation) whether the information flow is accomplished over ordinary communications lines or via satellite switching.

Optional extras at present are a portable thermal printer, and a light pen for bar code reading.

The display is a 12-digit liquid crystal type which enables the user to verify each entry visually before it is stored and to modify or erase data already in memory. The battery pack gives between 10 and 20 hours of power depending on the level of memory protection required after the machine is switched off. Protection is between 100 and 600 hours respectively.

A 100-terminal Mamopart system featuring Brown Boveri's own Mamopart 5 processor, and including features such as VDUs and line printers, would cost about £100,000. A new application has been developed for UCSL Microcomputers' M50 hand-held terminal, which has so far seen use in warehouse or retail stores as a stock-taking device.

Price of a two-terminal system starts at about £10,000, while a more powerful MVP processor-based system can be £45,000.

IBM raises most of its leasing and rental prices

IN a move to avert the threat to its profit margins from the strong trend towards leasing rather than outright purchase (CW, June 21), IBM has raised the lease and rental prices of most of its products, including some software.

The announcement caught industry analysts on the hop, because most of them were predicting purchase price reductions, particularly on the large 303X machines. These are now expected to be deferred until early next year.

Although the move will bring some relief to Amdahl and Itel, whose profits are under attack because of the strong trend towards leasing, price cuts which encouraged purchase would have been much more welcome.

The price increases affect all rental and lease contracts and cover almost all products from both the Data Processing and General Systems Divisions apart from those announced after October 1, 1978; the latter category includes System 38, 4300 and 8100. They apply to peripherals as well as CPUs, and are also applied to most System 3 licensed programs, including compilers.

For software, the increase is 10%, while for the hardware it is "up to" 8%. The price increases took effect on July 1 except where lease contracts specify a minimum period for notification of price rises.

Price restraint guidelines in the US limit the increases there

to 5%, and different levels have been set for various European countries.

Commenting on the move, Aharon Orlansky, of brokers Dean Witter Reynolds, thought that it would enable IBM to show an increase in fourth quarter profits over the same period last year, and allow the company to show a profit growth for 1979 as a whole.

"What has been forgotten is that IBM also needs to protect its profitability for 1980," he noted.

"Everyone has hailed the big boost in orders that IBM has taken without considering that the bulk of them are for new technology products for which IBM's production capacity is limited. If IBM cannot fill all those orders next year, they will not show up in the figures and the company needs a new source of revenue - hence the price increases.

"The move will bring home to users the fact that rental and lease contracts are subject to inflation, and there could be some psychological switching to purchase, but the tendency will still be towards leasing.

"If you calculate the price per MIP, you find that it is \$300,000 on the 4300 but \$900,000 for the 303X. Users have to assume that when the H-series appears to replace 303X, it will also be priced at around \$300,000 per MIP - and that means that the residual value of a 3033 in four years' time will only be 15% of its current price. That is a very

Modcomp introduces two mid-range models to Classic mini family

MODCOMP has added to its Classic minicomputer family with two mid-range models, the 7830 and 7835, with features that include 128K bytes on a single memory board. The company has also made several other new product announcements, including new tape and disc drives and two software packages, a time sharing executive called TSX and a database management system called Infinity.

The 7830 and 7835 are both compatible with Modcomp's Max III and Max IV operating systems, and the 7835 is the same as the 7830 except that it includes an arithmetic accelerator which provides a high speed floating point operations.

The new machines fit into the Classic line between the 7810, which is available in single board microcomputer form, and the bigger 7860 and 7870.

For users of the 7860 and 7870 Modcomp has just introduced a shared multipoint memory, SMM, system, said to be the first of its kind in the minicomputer industry. The SMM system can

connect to the memory buses of up to four 7860s/7870s, enabling them to share up to four Mbytes of memory.

According to Modcomp the TSX package is a general purpose time sharing executive and transaction processor that is transparent to standard Modcomp operating systems and to most user written terminal-oriented application programs. It dynamically schedules memory usage to allow any number of interactive users to perform concurrent processing.

The Infinity database management system supports multi user access to database files through the standard operating system's logical I/O structure. It can also support distributive database management configurations if it is used with Modcomp's Maxnet communications software.

The company has also introduced two moving head disc drives, the 4173 and 4174, and a magnetic tape subsystem, the Model 5550.

good reason not to buy one."

Orlansky also felt that the January launch date for the H-series could now slip to March or April, 1980.

"IBM has been imposing stringent cost controls through-

out the company because of the threat to its profits, and this could include a cut-back on development budgets, which would delay the H-series development program and with it the launch."

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GILB'S MYTHODOLOGY

Using the Function/Attribute Table for maintainability design



In the last column I showed how to explode a system maintainability objective into detail, in a measurable way. In this one, I will go one step further and show some of the design decisions which I would make to support those goals.

In the design specification list (see Figure 1) I have suggested 12 design rules which I hope and believe will help my system meet its design goals. I have assigned each of them a reference code. It would be outside the scope of this single column to explain each of these design rules, although many of them have been handled in earlier columns or are explained in my books.

The formal source of these design ideas is a Technique/Attribute Table, which is a list of design possibilities together with information about their effectiveness. Every experienced professional has such a T/A Table in his memory. Some of us write it down, how down, the better to review it and share it with others.

Do you think that this list of design specifications will produce a system capable of

meeting the maintainability specifications laid down in the previous column? One of them was that problems should in the worst case be identified within 24 hours and in the planned case within an hour. Will the database audit program (M.DBA) solve that problem for errors which develop in the database?

The answer is no; we must specify that the database audit program must be run at least every 24 hours. And that is not the end of it, but our goals remind us that we must make further design specifications if we are predictably to reach them.

As a first analysis tool to help us understand the consequences of our design decisions, I would like to show you the Function/Attribute/Component Table (see Figure 2) or F/A/C Table. The primary mission of an F/A/C Table is to give an overview of

design decisions in a complex system. In this case we see which maintainability objectives are affected by design decisions, and which system functions (hardware, files, programs, people) are affected by those same decisions.

Most important, we can see that the design process is clearly incomplete in several areas. These are the blank intersections — red-flag warning signals which remind us to do something constructive.

It is possible that some of the design decisions we have already made do in fact impact some of the "blank" areas. The blanks force us to ask the question, and to record the answer if they do have impact. We begin to get a more complete overview of the design consequences.

It is worth mentioning that both the design specifications and the functions can later be "exploded" for more detail and for more precise definition. In addition the functional breakdown I have shown here is only one of many possible breakdowns or architectural viewpoints. I can choose another viewpoint in addition, if this interests me. For example, Present Systems, Purchased Future Systems, Future Developed Systems In-House.

The F/A/C Table also serves as a checklist for a more quantitative evaluation of the design decisions using a Quota/Control table which I shall explain in the next column.

The concept of the F/A/C Table is derived from cost/value engineering methods. It was first proposed and used by Barry Boehm of TRW as "Requirements/Properties Matrix" (see IFIP 1974 proceedings) and the F/A/C Table is an adaptation of this concept.

The original problem which Boehm tried to solve at TRW was that of having to reprogram up to 80% of high-quality software projects before acceptance tests were completed. This resulted from the programmers trying to code programs based

Attribute	Functions				
	Application programs	Utility programs	Database	People and organization	Hardware
Problem recognition			M.DBA, RLH, M.MPG, RC		
Administrative delay				M.TEL	O
Tool and document control	M.TXT, M2PG, M.LIB	M.LIB	M.LIB	M.LIB	M.LIB
Problem analysis		M.AST		M.MPG, AST	
Change specification	M.2PG			M.MPG	
Active correction	M2PG		M.2PG	M.MPG	
Local correctness test	M.AST	MAST			
Global side-effect test	MAST, DBA, RLH	MAST, DBA, RLH	M.INS	M.INS	MAST, RC, RLH, DBA
Independent change audit	M.INS	M.INS		M.INS	O

Note: see Design Specification List for explanation of codes (Figure 1)

Figure 2: The Function/Attribute/Component Table.

on incomplete design specifications.

The reason for incompleteness was that the designers were making specifications without the overview given by an F/A/C Table. They made a lot of correct decisions, but they could not easily determine if the decisions they had made would be complete enough to meet the quality levels stated in software contracts. The blank spaces on

the F/A/C Table were the simple reminder and review overview that they needed. It would be too much of an ivory tower project simply to work out the maintainability effects of the design decisions made for maintainability. Of course we are interested in the cost effects and any other positive and negative side effects which these decisions have on the total design. We

must therefore be prepared to do a similar analysis job with only F/A/C Tables which lack these system properties. If all this seems like a lot of "extra work" to you, remember the TRW lesson. Extra work, but it is far more costly to have to re-do the system at a more detailed level, cause you have constructed a system based on incomplete design specifications.

PROGRAMMER NOTES

More than mere specialists

PROGRAMMERS are the DP manager's biggest headache. They take an irritatingly narrow view of their responsibilities; they place too great an emphasis on technical expertise; and they have an inflated view of their importance. They cause needless problems in the operations room, and create a poor impression of the department among its users.

Highly provocative words, undoubtedly. This argument was somewhat forcibly presented to us the other day by an acquaintance who was obviously suffering from high blood pressure. So were we at the end of it, but on mature reflection it does raise interesting questions about the role of the programmer in the commercial installation.

For example, the programmer is conventionally a technical specialist: who keeps within the confines of the computer department and has little contact with users. Should this not change, and the programmer assume something of an evangelist role, benevolently spreading the good word about computers?

Of course if they do, development work is going to be delayed, and as all such work is always required yesterday! If not earlier, the howls of protest can be imagined. On the other hand, these unreasonable demands are made precisely because their perpetrators do not understand either computing in general or programming in particular.

If programmers had spent more time explaining the computer's potential, perhaps the general view of the computer as something which can do anything on demand would not exist. And the odium which so many computer departments suffer would not persist either.

Another point: in too many installations the allocation of machine time to programmers is a constant source of friction. A good programming manager, in conjunction with a reasonable operations manager, can of course overcome this.

But to rely on good management is to sidestep the issue, and is in any case an unwise proceeding. Too many managers just aren't good at managing. In that case diplomatic skills are required to ensure that the programmer gets a reasonable slice of the action.

And why shouldn't program-

mers have diplomatic skills? There is a persistent myth that programmers are (and should be) introverts — command & control is essential, command of English an optional extra. Readers of this column will need telling just how silly that is.

These thoughts lead to the conclusion that the programmer should be something more than a technical specialist. He should develop his own dynamic role within the organization. And if this logic is convincing, perhaps there is more powerful incentive.

The pundits tell us that the commercial programmer will eventually disappear, as technology evolves to take over his functions. Technology will never evolve so as to take over human functions, however, as long as computers are going to be needed.

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SOFTWARE FILE

Dol backs Phase 2 of Project Gamma

THE novel idea of generating application programs directly from a system design database is at the heart of Software Sciences' Project Gamma, the second phase of which is being backed by the Ool's Advanced Computer Technology Project (ICW, June 28).

ACTP has put up £150,000 to help complete the development, with an equal sum being contributed jointly by Barclays Bank, Standard Telecommunications Laboratories and Software Sciences itself.

The current phase is now scheduled to end in 1980 with the completion of a working system which will generate IBM 370 assembler code. It will then consist, in software terms, of four main components.

The core component is the system design database. Somewhat like a data dictionary, this is referred to by Software Sciences as a "construct network database" and defines the relationships between system entities ranging from lowest level components, such as integers and dates, up to conceptual level constructs, such as a class of files.

The idea of a construct also

embraces processes, ranging from individual tasks and algorithms up to the level of an application suite.

The database is constructed and maintained by what Software Sciences calls a "front end" processor. This reads design statements written in a high level language called Gamma in which the construct network is expressed.

Then, from the machine-held representation of the design, a two-stage generation process is invoked to create a program.

The first and major step is the generation of a version of the program written in an intermediate code. This is followed by the translation of the code into a real programming language — in the first instance, IBM 370 assembler.

Gamma thus provides not only a tool for managing design information but also a means of generating software directly from the design, eliminating the programming stage entirely.

Figure 2 represents the operation of the Gamma database as contrasted with the conventional development process (Figure 1).

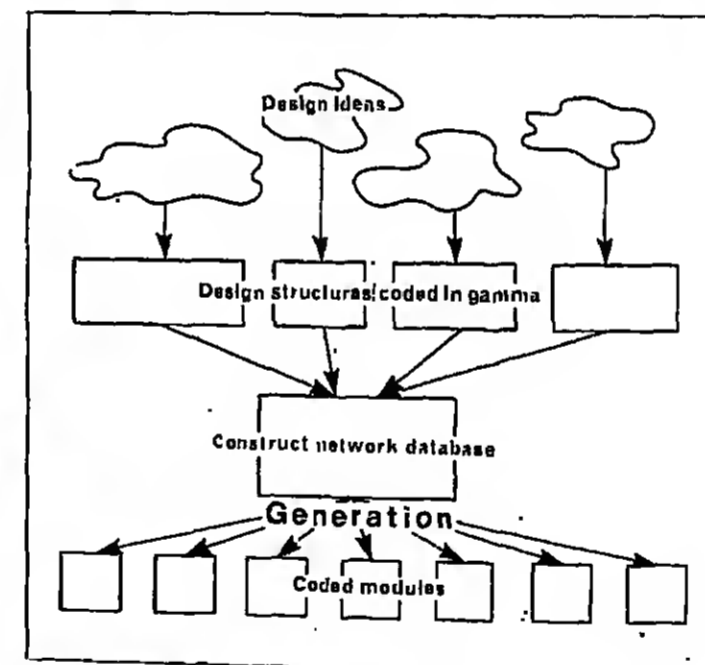


Figure 2: Gamma development process.

Tandem gets Mumps

THE popular interpretive language Mumps has been implemented by Tandem Computers for its Non-stop system. Fully compatible with the Anal 1977 standard, a feature of the software is that it will run concurrently with any other work under Tandem's Guardian operating system. It will be available in January.

Tandem has also added 3270-compatible access methods to its communications package Access; AM/3270 provides an interface between application

programs and a 3270-type terminal, while TR/3271 allows a Tandem system to be connected to a host by emulating a 3271 cluster controller.

All the software is unbundled, with AM/3270 and TR/3271 priced at £1,350 and £2,700 respectively. Mumps costs £4,700 with an additional microcode charge of £1,340 per processor, while X25/AM — has also been unbundled, now carrying a licence fee of £1,350.

Puzzler

WHILE on holiday recently, I popped into the local hostelry for lunch, and stayed on until three o'clock. As I left, I noticed that the hour hand on the pub clock was pointing to 6 instead of 3.

That night I went back to the same pub, and during the course of the evening happened to glance again at the clock just as the nine o'clock news started on a T.V. behind the bar. On this occasion the hour hand was

pointing exactly to 11.

Naturally I immediately raised this important subject with my host, but he averred that the clock always kept perfect time, and that none of his regulars ever had any trouble reading it.

To which number was the hour hand pointing at midnight, when the pubman was finally able to eject the last of us revelers? See page 53 for solution.

By Peter Hewitt

Hoping to repeat success

PROMPTED by the outstanding success of its West German subsidiary set up 18 months ago, Johnson Systems has established a similar subsidiary in the UK, which in the first instance will be selling its IBM DOS and OS Job Accounting Report System, Jars.

Jars was sold in the UK by Computer Associates up until three months ago, when the company switched to selling Jasper; this is the job accounting system on which CA has standardised worldwide, following its acquisition of the company which developed Jasper, Datachron Corp.

Jars has been a highly successful product for Johnson, which made over 400 new installations in 1978 alone. In the UK there are already around 80 users.

Johnson Systems (UK) is at 10 Station Road, Watford, Herts.

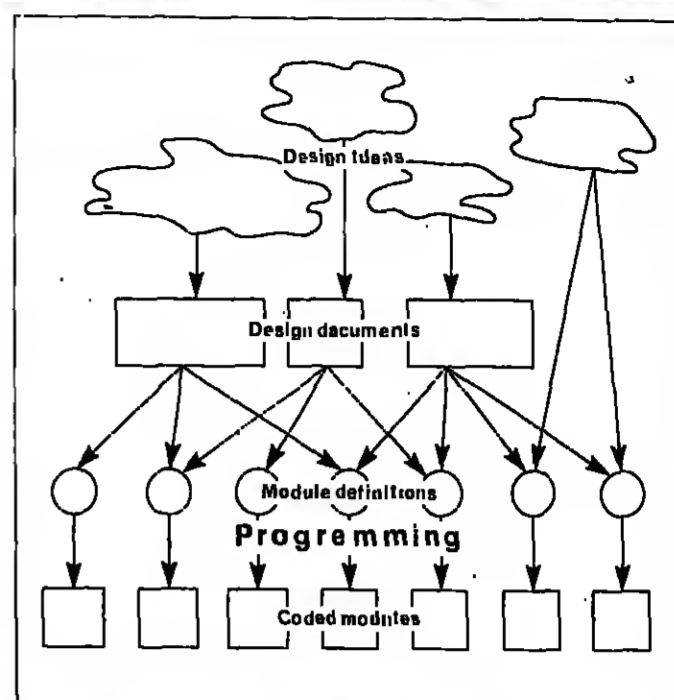


Figure 1: Conventional development process.

and could be of particular interest to suppliers of customised application packages.

As yet, though, Software Sciences has made no decisions

over the future marketing of Gammas, which will depend both on the outcome of the present development and on commercial considerations.



THE FINANCIAL SOFTWARE COMPANY

Q. Who is MSA (Management Science America) Limited?

A. We are part of MSA Inc., a worldwide computer software company developing and supporting financial applications.

Q. What do we do?

A. MSA provides a complete range of application systems covering cash management, financial management and personnel management to more than 3500 companies around the world.

Q. How can MSA help you?

A. Whether you need to develop an entirely new system or whether your existing systems have reached the saturation point and must be re-written, using a proven generalised software package will help you overcome the problems of:

Limited resources in your data processing departments. This will enable you to deliver the new systems without the need for additional people. Changing priorities in your business environment. You will be able

to deliver the systems you require without delay.

The communication gap between users and data processing. You can deliver the systems complete with all the necessary documentation and training.

Rising costs of data processing and systems development. You can deliver the systems for a known investment.

Q. What will this mean to you?

A. The use of a proven generalised software package will permit Immediate Implementation.

Q. What are the MSA application systems?

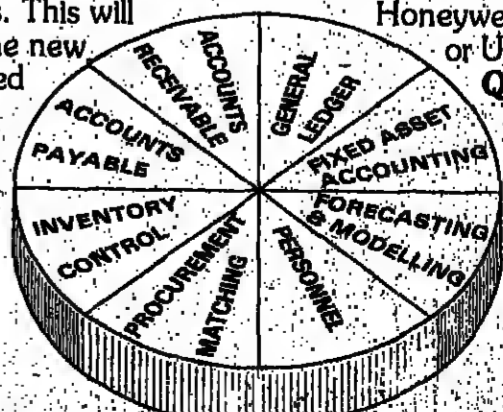
A. (see diagram).

Q. Who can use MSA?

A. Anyone in manufacturing, banking, insurance, building societies, distribution, transportation and Government utilising IBM, ICL, Honeywell, Burroughs, NCR or Univac hardware.

Q. How do you find out more?

A. Telephone Sue Spicer on Slough (0753) 70751.



MSA (Management Science America) Limited

1-9 Wexham Road, Slough, Berkshire SL1 1TP. Telephone: Slough (0753) 70751. Telex: 847400

This is Lowndes-Ajax

370/158 Attached Processor	ITEL 7031 Both with MVS/TSO	3850 Mass Storage	3705 SNA Support	Back-up Facilities
Werrington Multiplexor	Data 100 and TI Terminals	Computer Output Microfiche	Card Punching	System 2000 Database
SIMPLAN Corporate Modelling	General Ledger	Accounts Receivable & Payable	Fixed Asset Accounting	Payroll Service
Personnel Information	Direct Mail			

Lowndes-Ajax Computer Service
Lowndes-Ajax Computer Service, Milton House, Milton Road, Croydon CR9 2XG. Tel: 01-889 2244

A member of the Hill Samuel Group. Founder member of the C.S.A.

OP SPOT

Calling
Dave
Whitfield



Dave Whitfield would like to hear from Dave Whitfield, formerly an operator at Barclays Bank's Harlesden centre which has now re-located to site in Gloucester.

The last I heard of him, he was on a contract with Centraal Beker, an insurance company based near Amsterdam.

If anyone knows where he is at present, would they please contact me on 01-261 8035.

OP SPOT'S Bernard Allen would like to hear your opinions and ideas on all matters relating to computer operations. Your letters should be sent to Op Spot, Computer Weekly, Dersot House, Stamford Street, London SE1 9LU. Telephone calls are equally welcome and Bernard can be contacted directly on 01-261 8035.

HINT OF THE WEEK

Deleting O/P under Honeywell OS 2000

BY popular demand we have this week a hint which relates to an operating system other than those of IBM and ICL.

It concerns the use of job control language as a means of deleting output in the Honeywell OS 2000 environment. The author is Alan Friedlar, an operator at Desouters in Cullindale, North London.

He writes, "Discsorts under OS 2000 produce a couple of pages of print no-one wants, so the operator has to delete each one manually."

To do this, the operator has to type two commands in at the console. To ascertain that the listing is on the output file, he enters:

M/DTI-J=JOBNAME

In response, the system will send the operator a message informing him whether or not the listing is on the file. If it is, he enters:

M/DTI-D

The "D" stands for delete, and so this system deletes the listing from the file.

A better method which, according to Friedlar, is not mentioned in any of the Honeywell manuals, is to include the following piece of coding in the Discsort JCL:

COLUMN B.7. 15. 21. DISKORT...S. INFO NO

He goes on, "The card with the slashes (/) in columns six and seven relates to the system supervisor. The four commas and 'S' are not usually specified."

"The second card relates directly to the Discsort program. The 'INFO=NO' parameter instructs it not to produce a listing."

Bank and union negotiate on seven-day shift allowance

WILLIAMS & Glyn's Bank plans to implement an online cash dispensing system, but the operators at the bank's London centre have expressed reluctance to work the seven-day shift pattern needed to cover it.

And talks are in progress between the bank and the Banking Finance and Insurance Union (formerly NUBF) over the shift allowance to be awarded to the operators.

The union is negotiating for an allowance of at least 30%, with a fixed minimum of £880.

At present, the 40 operators at the centre work an eight-hour, two-shift system, providing five-day cover. For that they receive an allowance of 25% of basic salary.

Stoff at Barclays Bank recently accepted an allowance of 45% with a minimum and maximum of £1,131 and £2,828 for adopting a seven-day shift pattern (CW, June 7).

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Ops who don't want to be trained

OPERATIONS Manager: "How would you like a week in London, with no shifts, full pay, full board, and all expenses paid?"

Operator: "Nothing doing."

So ends an operations manager's attempt to send his staff on a training course — not as uncommon an occurrence as you might think, according to Ron Linton, operations controller at Manchester Polytechnic.

In a letter to Op Spot, Linton gives the "manager's viewpoint" on operations training.

"We have heard many comments from operators who are dissatisfied with the training they have been offered, but there exists in many cases an opposite problem — that of operators who do not wish to be trained."

Linton points out that while the single operator might jump at the chance of a course in London, the married person is likely to be less enthusiastic.

"A few years ago most operators were single, and glad of the chance to be away from the site, for a while; now many have families and to be away is for them a great inconvenience."

An alternative is to bring the courses to the operators, but problems also crop up with that method.

He goes on: "Some training organisations will arrange a course on the customer's own site, provided that there are enough operators to make it worthwhile."

"This usually means two or three sites arranging to share the course between them. Unfortunately, this is often not possible."

Audio-visual courses are an alternative, "but while there are a number for programmers, those for operators are comparatively rare as far as I know."

The attitude of operations staff is very important in relation to training. No matter how many courses are provided, if the operators are not interested, they won't learn.

"Every profession has people who are in it because it provides them with a convenient job. Such persons have little interest in personal development."

"This may be disappointing to the manager, but as long as they do their job he has no right to insist that they take a career interest — there are other things in life besides computers."

Such persons are unlikely to gain anything from additional training because "as any lecturer knows, the slightest boredom will spoil the student's chance of assimilating information."

Linton points out that training opportunities are available and it is up to the operators to "bully" their manager into arranging courses for them.

On the other hand, if the manager is faced with staff who are uninterested or unable to spend time away from home, there is nothing he can do about it.



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Glimpse into the future of word processing

TIME is expandable but buildings are not, so this year's International Word Processing Exhibition at Wembley Conference Centre will run over four days instead of last year's three. There was no room for any more exhibitors (42 at present), so the annual jamboree of the ever-expanding UK word processing industry will remain physically the same size.

Doubtless in future years it will follow Compec to Olympia, then Salisbury Plain — but it is predicted that WP will be leading DP before long.

As usual, Beta is running this year's show, which takes place between July 10 and 13 from 9.30 am to 5 pm (except for the last day when closing time is 4 pm). Free tickets can be obtained from Beta at 109 Kingsway, London WC2.

This year's conference programme, again put together by Online, is very much expanded, with eight different half-day seminars and two whole-day meetings. The short seminars deal with fairly specific topics in WP, such as choosing equipment, reviewing the latest technology, WP supervision, and specific applications.

The topics for the longer conferences are two old favourites, the human side of WP (The People Factor) and the Elec-

tronic Office of the Future, or OOF, as it is known to aficionados.

New faces among those talking will include Chris Ellis of Nexos, and Robin Dasey from the research department of the white-collar union Apex. Dasey has stepped into the shoes of David Cockcroft who was heavily involved in WP before he went to Geneva to work on the international trade union scene.

New faces among the exhibitors will be few. The last 12 months have been fairly uneventful in the WP arena: Nexos has yet and so will not be present, except as represented by Logica; some smaller firms such as Jacquard have been taken over by the giants who are keen to get in names have not been abolished. AES Wordplex has exposed itself on television, making a colossal hole in its advertising budget in the process.

Competitors can be glad that the idea of WP is being promoted at no cost to them, but won't be so glad if Wordplex succeeds in its avowed aim to make its name a synonym for word processor: it is making some progress here already.

New models of word processors being launched at this year's fair include the CPT 6000, which is a low-cost version of

particularly Apex, discovered word processing, and the spectre of hordes of unemployed typists was spread abroad, but failed to convince employers who are turning to WP as the only solution to their staff shortages.

The most notable newcomer at the show will be ICL, which, with its 7700 Information Processor, will be aiming to convince the world that at least one of the big computer manufacturers understands what word processing is. The firm intends to demonstrate both electronic mail and large-scale filing by a link with a 1904S mainframe in Reading. The 7700 is claimed to be capable of both word and data processing, and visitors will be interested to see whether both these two widely differing tasks can in the event be dealt with properly and professionally.

New models of word processors being launched



Hon DSc for Tom Kilburn

A leading figure in computer engineering, Professor Tom Kilburn, has been awarded the honorary degree of DSc by Bath University. Professor Kilburn, who became professor of computer engineering at Manchester University in 1960, received an honorary doctorate from Brunel University in 1977 for his valuable work with computers, particularly his involvement in the development of several innovative systems at Manchester.

Dick Henry, Wyn Thomas and Martin Palmer have been appointed area sales managers for the computer systems division of Centurion Automation. Henry joins the company from Rediffon Computers, where he was a senior territory manager, and Thomas was formerly regional sales manager for Cable and Wireless. Palmer was a senior sales executive for ICL. All three sales managers will be based in the South.

Sally Carpenter has been appointed by Electronic Brokers as sales director, computers. She was previously sales manager for computers, and has been with the company for eight years.

Motorola names European manager

TAKING charge of Motorola's European MOS production centre at East Kilbride, Scotland, is Marc Lassus, who has been appointed general manager of the centre. Lassus, who has worked for the company since 1967, started the first digital device production for Motorola in 1970 at Toulouse, and since then has worked as digital products manager and European operations manager for linear products.

Paul Kirten has become Northern regional director of the data processing division of Henleywell Information Systems. He was formerly director of marketing services for the company, and in his new position will be based at Henleywell's northern regional headquarters in Cheshire, Cheshire.

Ian McIlroy has become sales and marketing manager for Microware. He was formerly sales manager for a Danish computer company, Kelti Røhler, previously development manager of Beeing's computer bureau, is now sales executive for Microware.

David McCadden has joined Computer Machinery Company's Technical Support department in Birmingham. He was previously employed by ICL where he was a senior support technician.

Michael Hartley has joined BIS Applied Systems as a consultant, based at the company's Manchester offices. Prior to this appointment he was a systems analyst with the British Gas Corporation and the North Western Electricity Board.

Malcum Carter has become a sales engineer for Intel's systems sales, and will operate in the North of England. He was formerly on instrumentation field sales engineer, at van Wels will work in the South of England as sales engineer for the South of England. He used to be a salesman for Digital Equipment.

John Ring has been named as vice-president of the new word processing division of Dataproducts Corp. He joined Dataproducts in March when the company purchased the Plessey Peripherals systems printer division, which he had headed as divisional director.

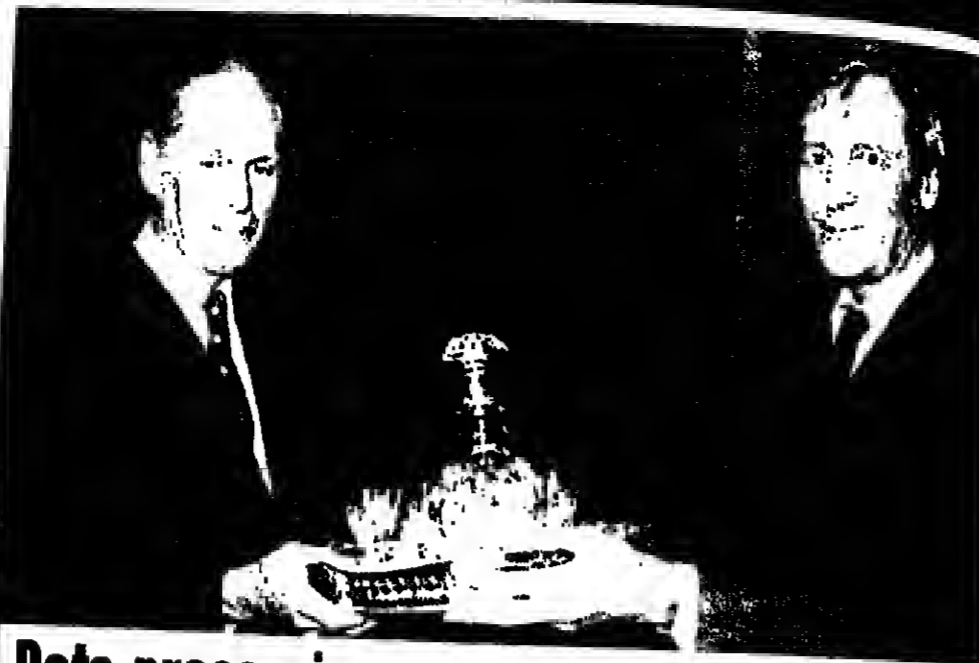
Chris Wilsford, previously a specialist salesman with Burroughs, has been appointed territory manager with General Computer Systems, to market the Qantel range of business and financial computers throughout South East England. Anthony Loades-Carter has also been appointed to a similar position. He was formerly a senior salesman with ICL.

Richard Neal has joined Rediffon Computers as senior production engineer. He was previously project engineer with EWP. Roy Page has also become a production engineer, joining the company from Key-switch Relays, where he held a similar position.

Fredrick McGibbon has become manager for Ireland with Hewlett-Packard. His responsibilities will include the formulation of the first five-year business plan for the company in Ireland. He has previously worked as a salesman and sales manager for ICL in Ireland and Canada.

Howard Dodds has become sales executive for FOCAS, the service offered by Lowndes-Ajax to fleet managers throughout the country. Dodds was formerly a technical sales executive with Applied Chemicals.

Peter Bowden Winder has been appointed to the board of Atkins On-Line as sales director. He will be based at the company's Epsom headquarters. His most recent appointment was with Comshare, where he held the post of divisional director.



Data processing manager of the year

"An example to everyone in data processing" is how the judges of the Data Processing Manager of the Year competition described the winner, Bob Johnson, of Data Building Products, Birmingham. The IDPM/Data Logic award is presented annually for outstanding achievement in data processing. Johnson has been working with computers since 1967, and won the prize on the strength of his collective and economic use of systems with improved customer service at no extra cost.

P & O changes

P&O Computer Services has announced that it will now become part of a new wholly owned P&O company, to be known as P&O Consultancy and Computer Services. It will be moving soon to new premises in Westford. For details ring Rick-mansworth 71111.

Saan Nash, a former RAF telecommunications expert, has become a sales manager for Rach Norex, the peripheral and software marketing company. He will be based at the company's offices in Bourne End, Buckinghamshire.

Maths marathon

A PROGRAMMER with Soa Consultancy International, Mike Turbitt, has been chosen for fourth place at the International Mathematical Olympiad, in East from July 1-9.

Problem solving mathematical questions will be tackled by eight teams from 22 countries. Competitors are under the age of 20. Turbitt won a second prize in the British Mathematical Olympiad. He has been working in a management science division for the past ten months.

F International appointments

F INTERNATIONAL, the London-based software house, has announced the following appointments: Mary Dawkins has become senior project manager for the Northern region; senior marketing executive for the Southern region is Sheena Ingalls, a former systems engineer with IBM; former technical analyst with the Corporation of Liverpool, Sarah Nurse has become senior project manager for the Western region; and for British Leyland as divisional systems manager for Austin Morris.

Johnny Johnson, until recently administration manager for Canadian Royal Assurance at Lytham, is now the computer operations manager for the company.

Peter Errington, a former sales manager with ITT, has been appointed by Armit (UK) as a sales executive. He will specialise in the inter-city range of systems.

Alan Weston has become business planning manager of ICL, Dunsford, where he will be responsible for organising and reviewing the two and five year plans of the company. He was previously a financial controller with Gould, and before that a corporate planner with Ford of Europe.

DIARY

JULY 5-11 Consumer electronics symposium. Society of Electronic and Radio Technicians. University of Essex, Colchester.

JULY 11-13 Expert systems in the micro-electronic age. AISB summer school. Pollock Hall, Edinburgh University, Edinburgh. 8.00.

JULY 12 Education for the future IV: education by computer? ASE, CET, SCST. Bradford University, Bradford. 9.30.

JULY 13-19 Operational data security workshop. Operational Data Security Corp. Hotel Zurich, Zurich, Switzerland.

JULY 13 Who audits our freedom? IDPM. Paul and Dean Studio, Broadwick House, Broadwick Street, London W1. 13.00.

JULY 13-19 IBM CUA Local authorities group. County Centre, Cambridge.

JULY 13-17 Workshop on program transformation. BCS Formal aspects of computing group. Imperial College, London.

Paul's heart in the right place

Paul Bennett, a computer operations manager at Rumbold's head office at Waltham Cross, receives the Stihl award from TV star Angered Rees. He was the top individual fund raiser in the British Heart Foundation's 1979 sponsored slimming campaign. Paul lost 28 lb, raised £458.87 and won a holiday voucher worth £250.

As a result of the campaign, over £57,500 was raised by the slim for heart research. All the prizes were donated by Cedbury's Marvel. Pictured here (left to right) are Roger D'Donnell, product manager of Marvel, Paul Bennett, Angered Rees and Christopher Cazenove, the actor.

Teacher seeks advice on schools equipment

I AM a teacher in a South Wales comprehensive school and responsible for computer studies/science to CSE, 'O' Level and 'A' Level. I would be most grateful for the use of your columns to communicate with other teachers and lecturers in computing to seek their advice and assistance.

I have the use of a teletype, capable of being linked to an ICL 1904 and to a Digital Equipment PDP/11-34, as well as a postal service. I wish to extend the computing facility by perhaps acquiring a micro-processor or small mini, either new or secondhand. I wish to obtain information about the

use of the above equipment in schools and recommended sources of this equipment. I believe there are groups of teachers/lecturers able to advise on the use of micro, small minis and secondhand equipment. I would be most grateful to anyone who could supply me with this information I need.

I would also be most grateful to anyone who can supply me with reasons for using a school-based computer as opposed to using a terminal.

M. G. PAUL HUTCHINSON
Whitford,
Pontypool,
Mid-Glam CF37 6P.

Braille terminal sought

DOES anyone know of any second-hand, interactive Braille terminal which might be available for loan, lease or sale as from September 1979? We need such a terminal for a computer science student for a period of two years to enable him to have computing facilities comparable with those of his sighted fellows.

L.R. MacCALLUM
Senior Lecturer

University of Essex,
Department of Computer Science,
Wivenhoe Park,
Colchester,
CO4 3SQ.

Schools need new science subject

IVOR CATT'S letter concerning the misconceptions about the nature of digital semiconductor devices and systems among, not just the public, but the computer industry, hits the nail right on the head.

As one involved in teaching computing and electronics in schools, I am very aware of the division-between hardware and software approaches, and I am deeply disturbed by the lack of suitable syllabuses which combine these aspects (the AEB A Level "Electronic Systems" possibly excepted - and this does not cover the main age group of 11-16 years).

What I feel is required is a new science subject in schools, being a synthesis of solid state electronics at a "systems" level and computing. This should be taught from 11 to 18 and be additional to existing science subjects.

There is too much in modern

electronics for it to be taught as part of physics (integrated circuits are not even mentioned in most A Level physics syllabuses) and there is too much in computing for it to be taught as part of mathematics.

Over recent years various "soft option" arts subjects have appeared in schools. Why should we not now state our case when we have a discipline which has an extreme of intellectual rigour, good career prospects and the opportunity for great creativity on the part of the pupil. What other discipline offers these in one package?

Who will teach it? How can existing teachers be retrained, and how can heads, who are often not even scientists let alone technologists, be persuaded to finance and make room for the subject? These are all \$64,000 questions but answers to them must be found, and soon.

PAUL STEVENSON
Physics Department,
Norwich High School for Girls,
Norwich.

program modules, the integrated database and the idea that some good data could be gleaned even from bad input.

No doubt other teams were developing the same ideas at the same time, but it seems that even today there is still no easy way whereby useful ideas and techniques can be pooled and shared.

Recently I have been looking at application software being offered with the latest small computer systems, and really a lot of it is still very crude and vulnerable to user errors.

Very often it seems that the designers of today's small computer systems have abandoned the principles of program and system design that were established and proven for the high mainframe years ago.

Last week I looked at a brand new small computer system that allowed the user, merely by pressing the wrong button, to update his database with the same data two or three times, when of course it should only have been possible to update once.

Does the software industry have to go on for ever rediscovering the wheel?

J. E. C. CARTWRIGHT
Penzance,
Cornwall.

Teacher seeks advice on schools equipment

I AM a teacher in a South Wales comprehensive school and responsible for computer studies/science to CSE, 'O' Level and 'A' Level. I would be most grateful for the use of your columns to communicate with other teachers and lecturers in computing to seek their advice and assistance.

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M. G. PAUL HUTCHINSON
Whitford,
Pontypool,
Mid-Glam CF37 6P.

LETTERS

To: The Editor, Computer Weekly,
Dorset House, Stamford Street, London SE1 9LU

NCC wants your views on databases

IN collaboration with similar organisations in Germany, Italy and France, the National Computing Centre is undertaking a major study into database usage.

The work, partly sponsored by EEC, covers a very comprehensive range of topics, and it is anticipated that the published findings will be helpful to computer users and in particular to those organisations thinking of adopting the database approach.

NCC is about to start work in the areas of database administration and data dictionary systems. May I ask any of your readers who have experience of these topics and who would be prepared to make their experience available for the study, to contact me. It would be especially useful to hear from those with strongly held views - positive or negative.

D. P. NICHOLLS
Senior Consultant,
DP Methods Division,
NCC,
Oxford Road,
Manchester, M1 7ED.

Union fears for future of ICL

From front page
Investments. It sold its 6% stake in Amdahl at a good profit, and any ICL shares bought and subsequently sold over the past three or four years would have shown a substantial gain.

The possibility of a Nixdorf bid for ICL is at present extremely remote, because Nixdorf is only about half the size of ICL. In the early 1970s there were discussions about Nixdorf getting together with ICL but there has been none recently. Nixdorf itself was involved in a major financial deal with Deutsche Bank late last year to secure its future and raise capital for faster expansion.

TASS believes that the computer, electronic and telecommunications industries are now so capital-intensive and bound up with government purchasing policies around the world, that only by long-term national planning with direct government involvement can the UK remain a force in the market, and regards the NEB stake in ICL as vital to this.

CW Soccer: tables and results

RESULTS	Division 1	Division 2	Division 3	Division 4	Division 5	Division 6	Division 7	Division 8	Division 9	Division 10
Atkins 4, Altergo 3	3M 4, UCST 1	3M 4, UCST 1	3M 4, UCST 1	3M 4, UCST 1	3M 4, UCST 1	3M 4, UCST 1	3M 4, UCST 1	3M 4, UCST 1	3M 4, UCST 1	3M 4, UCST 1
SIA 0, Gryphon 1	CJB 3, Shawwood 0	CJB 3, Shawwood 0	CJB 3, Shawwood 0	CJB 3, Shawwood 0	CJB 3, Shawwood 0	CJB 3, Shawwood 0	CJB 3, Shawwood 0	CJB 3, Shawwood 0	CJB 3, Shawwood 0	CJB 3, Shawwood 0
Gryphon 5, Atkins 2										
Comshare 4, Oatsoolve WE 3										

TABLES	Division 1	Division 2	Division 3	Division 4	Division 5	Division 6	Division 7	Division 8	Division 9	Division 10
Gryphon	P W D L F A Pts									
SIA	5 3 1 1 17 4 9									
Atkins	4 2 0 2 15 13 4									
Altergo	3 0 1 2 4 7 1									
Jadpu A	2 0 1 1 4 7 1									
Daracene	3 0 0 3 5 17 0									

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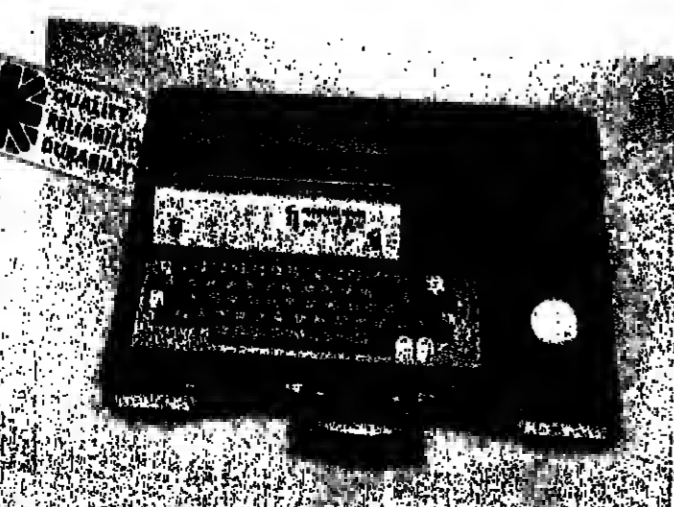
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Jadpu A	2 0 1 1 4 7 1									
Daracene	3 0 0 3 5 17 0									

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00-7458	4 8MB Disc Controller for Data Guard	£1250
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00-7460	4 8MB Disc Controller for Data Guard	£1250
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00-7462	4 8MB Disc Controller for Data Guard	£1250
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00-7480	4 8MB Disc Controller for Data Guard	£1250
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00-7499	2 4MB Disc Controller for Data Guard	£1250
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MICRO NEWS

Briefcase system's 'world first' claim

WHAT has been described as the first computer in a briefcase was introduced last week by Data Logic, which has worked with Allied Breweries to produce the system.

Known as the Microframe (intended as the antithesis of mainframe) the new system has been developed with the long-term aim of being a portable general-purpose computer system.

The "world's first" claim may strike a strange note with French computer manufacturer R2E. At Sibob in 1977 it introduced the Micral V (for Valise) computer system (CW, September 29, 1977). The specifications for the two systems are not dissimilar.

The Data Logic system is based on an Intel 8080 processor equipped with 16K bytes of

memory. This is expandable up to 32K bytes. The Micral V is 280-based, and comes with 32K bytes of main memory as standard. Microframe has an 80K-byte Shugart mini-floppy disc drive, while the Micral V has 150K bytes of dual density mini floppy storage.

The Microframe has a 20-column thermal printer, while the Micral V is equipped with a 32-column unit; the Microframe has, in the Allied Breweries application, a 20-key numeric keypad, and the Micral V has a full qwerty keyboard fitted.

For display purposes, the Microframe has a small, four-inch, video monitor, while the Micral V uses a 12-line by 40-character plasma display.

Software for the Microframe has been written in Intel's PL/M, and Data Logic says that any

software written in either Assembler or PL/M will run on the system. On the Micral V Fortran IV, Business Basic, and Micro Facus, CIS Cobol are available.

According to Allied Breweries, the main reason it decided to seek Data Logic's assistance in developing Microframe, rather than using the Micral V, were that the latter is heavier — 14Kg compared to 10Kg, more expensive — £5,000 compared to £3,000 approximately, and perhaps most important of all, it is unsupported in the UK.

In the specific Allied Breweries application Microframe has been originally developed for, it will be used by public stockholders to provide landlords and managers with an immediate reckoning of the financial performance of the public house.

The system, which is still in the pre-production stage at Data Logic, will initially go out on trial in one area of Allied's territory, probably in the north-east of England. Once the trials have been successfully completed, the company's six beer divisions operating managed pubs will be offered the opportunity to purchase production models.

Data Logic is hopeful, however, of selling many more of the Microframe systems than the number Allied Breweries will purchase, which is estimated at around 150 units.

It is already working on extending the system to incorporate a qwerty keyboard, a V24 interface, an IBM 2780 interface for direct connection to a mainframe computer, dual mini floppy disc drives, 8-inch disc drives and a normal-sized video display.

A version for the general market is expected to be available by the end of this year, according to Data Logic, and the company is also hoping to sell the system in the US through its parent company, Raytheon.

Out on his own from Nascom

FORMER software director of Nascom Microcomputers Tony Rundle has left the company to form his own software company, Starbase.

His move will not deprive Nascom of his services, however. Most recently he was involved in extending the Microsoft Basic interpreter for the company.

He will still be involved with the company, in fact his first products will be a range of cassette-based programs for the Nascom 1 and 2 systems. But he will have greater freedom to produce personal computer software, and he has plans for products for both the Commodore Pet and the Ohio Scientific Superboard.



Tony Rundle

\$180 billion world market—report

THE world market for microelectronics-based products is now about \$180 billion, and growing at 12% per year, according to a new report published by the Economist Intelligence Unit.

The report, Chips in the 1980s, sets out to cover, in layman's language, the application of microelectronics technology to consumer and business markets.

It makes the point that of this

\$6 billion goes to the manufacturers of the chips themselves. "Application program development," the report states, "forms the largest cost in chip-based technology," and it suggests that this is a prime reason why many of the semiconductor companies are becoming more systems-oriented.

As an exercise for the layman, the report traces a typical (if hypothetical) new application of microelectronics through from the original idea to manufacture

8K memory configuration.

The specification of the system includes the use of three microprocessors, two Z80s and one Intel 8748. Main memory is a minimum of 32K bytes, expandable up to 64K bytes, while secondary storage is provided by up to three Shugart SA 400 mini-floppy disc drives. A 10-Mbyte hard disc option is also available.

The system is completed by a video display, a keyboard and three keypads providing a total of 132 keys, and a daisy wheel printer. The whole package comes in desk-top housing measuring 24 by 48 inches.

Software for the Leprechaun is available in Fortran, Cobol and Basic, and applications programs to handle standard small business problems such as inventory control and general ledger are available. According to the company, one of its first

likely applications will be word processing.

The system comes with editor/composer software. It has been organised specifically for word processing tasks. Its functions include file search, global editing, document assembly, automatic hyphenation, paragraph spacing, automatic page numbering and accents for French and other languages.

It has been designed, the company states, to be immediately useful to a typist and the training time needed to make an operator productive is said to be less than a day.

This has been achieved by greatly expanding the number of control keys available to the operator, so that the major commands can be entered by simple keystroke rather than with multiple keystrokes.

Cromemco UK dealer

ANOTHER company has been appointed by Californian microcomputer manufacturer, Cromemco, as UK dealer for its range of hardware.

The company, La Dutton, based in Sheffield, and a new Microcentra division is being

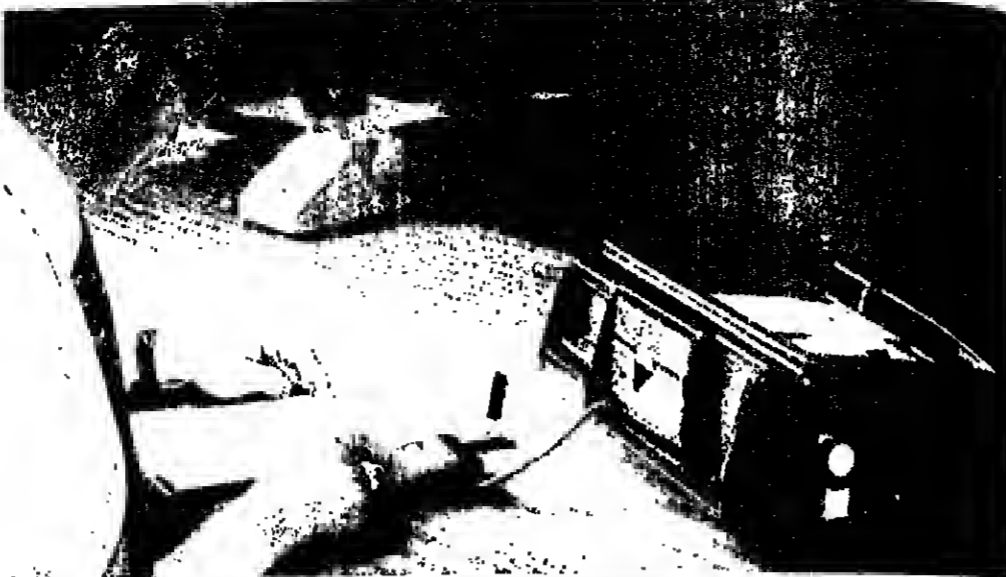
established by it to handle business.

Among the Cromemco products, Datron will be selling both the System 3, and the 22-H hard disc computer. The 22-H hard disc computer has dual floppy discs and a 64K bytes of main memory. Its price is expected to be around £1,200, and cost of the Datron 220, and cost of the support for TIF, Cromemco's Pat computer system.

S-100 bus THE popular S-100 bus computer bus is now moving towards final approval by the Institute of Electrical and Electronic Engineers (IEEE).

The report, Chips in the 1980s, is published by the Economist Intelligence Unit, Spencer House, 27 St James's Place, London SW1A 1NT.

by Martin Banks



The "world's first" computer in a briefcase, introduced last week by Data Logic, is pictured above. On the right is the Micral V, a remarkably similar system from R2E in France (accompanied by R2E president Thi Truong). The Micral V was introduced in September 1977.



Transatlantic leprechaun will soon be available in Europe

A CANADIAN leprechaun — if that is not a contradiction in terms — is about to be launched into Europe. Leprechaun is the name given to a new desk-top microcomputer system by its manufacturer, Patrick Computer Systems of Winnipeg.

The company is currently in the throes of establishing European distributors for the system, which has an FOB price of £8,097.56 in its most common,

8K memory configuration.

The specification of the system includes the use of three microprocessors, two Z80s and one Intel 8748. Main memory is a minimum of 32K bytes, expandable up to 64K bytes, while secondary storage is provided by up to three Shugart SA 400 mini-floppy disc drives. A 10-Mbyte hard disc option is also available.

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Philips and Siemens personal market bids

From front page

with no knowledge of computers to write a program of up to 50 steps to manipulate alphanumeric characters and symbols of men, battleships and racing cars on screen.

Recognising the limitations of the system, the instruction booklet suggests that those who develop an interest will want to go on to more advanced languages and systems.

The G7000 has a basic unit with a 49-key alphanumeric keyboard, a pair of joystick controls and colour TV interface. However, it relies for its operation on a plug-in RDM module called a Videopac. One is supplied with the basic unit containing three games. Several other games modules are available at about £10 each, and Videopac 9, the computer programming module, enables short programs to be written in a simplified form of machine code.

Currently available Videopacs take the form of RDM cartridges mounted on circuit boards with edge connectors. The socket into which they plug could be the route for future expansion. A cassette storage interface is planned for later this year, and the RAM may be extended from its present 128 bytes, either by substituting a higher capacity single chip device or through the cartridge socket.

The basic unit uses the Intel 8048 processor chip, but the Programmer Videopac implements its own set of 29 one or two byte "machine codes" which can be entered either as hexadecimal numbers, or as mnemonics.

All input is from the keyboard and all output goes to the screen. The 64 character set has upper case letters only, plus numbers and graphics symbols. They use a large seven by seven matrix and only 256 characters fill the screen.

The Siemens PC100 was announced at the Hannover Fair and is now sold in West Germany. Expected in the UK later this month, it will sell in open chassis form for about £800 with a 20 character LED display and a 20 column thermal printer.

£50m UK market for retail laser scanning forecast by 1984

THE market for retail laser scanning equipment, to read bar-coded product labels in supermarkets, will stand at about £50 million and financially account for 50% of the total installed base of electronic checkouts in the UK by 1984.

One of the conclusions of a report published this week, it highlights the changes to come for both manufacturer and shopper as product coding systems — either the Universal Product Code or the European Article Number — are implemented.

The report, Electronics in Supermarkets, says that the £100 million total installed base will be made up of 8,000 laser and 25,000 non-laser checkouts, and that the major growth factor, ignoring union or customer resistance, will be the rate at which products are coded and the volume of items so marked.

Economic operation of laser equipped checkouts requires at least 80% of items to be marked, suggests the report, but it does give a compromise solution.

Nanodata builds on microcode lead

ALTHOUGH only a recent arrival on the IBM plug-compatible mainframe market, Nanodata Corp of Buffalo, New York, has been selling a universal emulator, the QM-1, for about four years. The QM-1 predates the bit-slice microprocessor, which makes the building of emulators comparatively straightforward, and as a result, Nanodata has well developed skills in micro-coding.

The QM-1 is built in traditional TTL technology, and comes without a native instruction set. It can instead be microcoded to emulate almost any other computer, and also allows emulation of several dissimilar

Mammoth task faces IBM

SIXTY-TWO thousand man-years of effort will be required to comply with the demand, says IBM, but the company has nevertheless been ordered to produce further documents in the mammoth US Justice Department suit against it.

The documents, originally demanded in February, relate to chairman Frank Cary's testimony. IBM declared the demand unreasonable and oppressive, but its appeal has been overruled by Judge Edelman. It is possible that withdrawal of Cary as a witness would remove the need to produce the documents.

New machines for Swansea

STUDIES are now being carried out on the specifications for replacements of the mainframes at the Driving and Vehicle Licensing Centre, Swansea. The change is at present scheduled for 1983, Transport Minister Norman Fowler told the Commons.

Replying to the former Transport Minister William Rogers, Fowler said it would be premature to speculate on the likely cost of the project. At present, the centre has one ICL System 4/70 and two 4/72s.

machines to run on the same QM-1 processor in parallel.

Universal emulators are widely used by the US forces and the aerospace industry. Applications include software development and debugging, since the machine was intrinsically designed to facilitate this; hardware design; substitution for a system component not yet available; evaluation of a variety of machines running the same software before the machines are available; and checking the trade-offs between software and hardware modifications.

Machines already emulated on the QM-1 include the Intel 8080, CDC-160A, Data General Nova, Univac 1106, IBM 360 and 370, IBM 7094, DEC PDP-11 and Motorola 6800. Emulations of a wide variety of specialised military computers like the Univac AN/UyK-20 have also been done.

It has an internal 80 nanosecond cycle, and the user programmable control memory consists of 1K 360-bit words

horizontally and 40K 18-bit words vertically. The vertical microcode is similar to machine language coding, and the horizontal is the control unit actually driving the hardware.

Although most QM-1s have been sold for software development applications, a few are in use as back-up to old machines like the IBM 7094. However Nanodata's main thrust into the commercial market is with its VMX IBM 370 emulation.

The VMX, like the Magnascan M80, is more than a simple 370 emulator. It has been designed to allow up to four different emulations to run concurrently on the same machine, and is available in multiprocessor configurations. The single processor VMX is claimed to offer power in excess of the 370/148 "at minicomputer prices."

A wide variety of bit-alloc and other microprocessors are used in the VMX. In both TTL and ECL technology. First deliveries are set for the last quarter of this year.

Hopes of swift end to Univac 9-week strike

THE strike at Univac's Twin Cities plant in Minnesota, which builds the 1100 line for the worldwide market, entered its ninth week on Monday, but talks with the striking engineers were under way and both sides are hopeful of a swift solution.

Meanwhile Univac has issued a strong denial that any new models are planned in the 90-series at present, and specifically stated that there is no truth in French reports that new 90-series models will be announced at Sibob in September (CW, June 28).

Speculation that there would be new 90-series models has been fuelled by IBM's announcement of the System 38 and the 4300 machines which compete in the same market.

However, the latest models in the 80-series, the 80/40 for OS/3 users and the top-end 80/80-4 for V8/9 users, each of which offer enhanced performance by the addition of cache memory, were announced only a year ago, in May 1978.

Univac reports that despite the IBM announcements, the 80-series in its present form is doing conspicuously well, and that March 1978 was the best month yet for 80-series sales.

Univac office machines go into US In both price and capabilities, the Astru competes directly with IBM's System 32 and System 34.

Training centre

THE NRDC's high technology software subsidiary Compeda has opened a training centre in Silicon Valley, California, to provide courses in the Gaelic package for the design and manufacture of integrated circuits.

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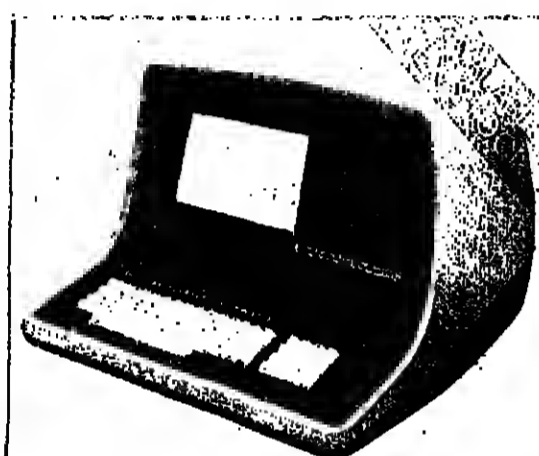
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TEXAS INSTRUMENTS

INTRODUCTION TO PASCAL

The simplest, yet most powerful aid to bug-free programming



By Dr
Judy
Bishop

In the second of our 10-part series, Introduction to Pascal, Dr Judy Bishop looks at aids to bug-free programming. Dr Bishop, a lecturer in computer science at Witwatersrand University, South Africa, first became acquainted with Pascal when she was studying for her PhD at Southampton University. Previously a user of Algol 60, Fortran and various assembly languages, she has since adopted Pascal for everything she programs.

Part 2

Record, symbolic values and subranges

THE designer of Pascal, Niklaus Wirth, has written many books on programming, one of the most popular going by the refreshing title of "Algorithms + Data Structures = Programs". Most programmers would agree that if we can get the data defined nicely and devise a suitable algorithm, then we've got a program. But will it work? Shakespeare put the problem well in Henry IV, Part I:

GLENDOWER: I can call spirits from the vasty deep.
HOTSPUR: Why so can I, or so can any man;
But will they come when you do call for them?

Conscious of the incalculable and often fruitless hours, both of man and machine, spent in debugging, Wirth built into Pascal safeguards against common programming errors. Instead of assuming that "the programmer knows best", even if he is trying to add numbers of children to days-off-sick and put the answer in next-of-kin, the language insists that you say what you mean and that you are consistent. To use a language designers' term, Pascal is strongly typed; you must give everything a type and cannot normally mix objects of different types.

Record time

This week we shall look at some of these self-protecting types in the context of our example of a Flexitime system. The most common objects we will be dealing with will be times, clock-on time, clock-off time, "core" time, and so on. So we define a type which says exactly what a "time" looks like as follows:

```
TYPE time = RECORD
  day: (mon, tues, wed, thurs, fri, sat, sun);
  hour: 0..23;
  min: 0..59;
END;
```

The first advance towards bug-free data is that the components of a time are known by name, ie day, hour and min. Languages without a record facility, like Fortran and Basic, have to rely on comments or appended "convention tables" to remind all who come into contact with the program that T(1) holds the day, T(2) the hour, and T(3) the minutes. How often are these comments out-of-date or even non-existent?

Those who know Cobol, PL/I or Algol 68 will be familiar with records (or structures) but might be puzzled by the lack of level number. Pascal does without level numbers and achieves the same effect by "nesting" the record definitions. Deviating from Flexitime for a moment, let us illustrate this point by incorporating time in another type.

Records in records

Here is a type that might be used for baby tags in a maternity ward.

```
TYPE baby = RECORD
  sex: (male, female);
  doctor, mother: name;
  birth: time;
END;
```

(A) Unpacked

Day	Full-word
Hour	Full-word
Min	Full-word

(B) Fully packed

3	5	6	(bits)

d	h	m
o	a	i
y	u	n
r		

(C) Packed on byte boundaries

3	5	5	3	6	2	(bytes)

d	h	m
o	a	i
y	u	n
r		

Figure 1. Actual storage structures for time

Assuming that name is some character array type (defined elsewhere), a baby tag could be depicted diagrammatically as:

SEX	Female
DOCTOR	Dr Cohen
MOTHER	Mrs J. Wright
BIRTH DAY	Wed
HOUR	4
MIN	33

The whole birth field can be moved around as an entity, or parts of it can be extracted by means of the usual "dot" notation. For example, if we declare:

```
VAR thisbaby: baby;
```

(ie that thisbaby is in a variable of type baby) then valid fields of this variable are:

```
thisbaby.sex
thisbaby.birth.day
thisbaby.birth
```

but not

```
thisbaby.day
```

Pascal insists you say what you mean and that each step in the record nesting is mentioned. Even if it is thought that there would be no ambiguity if some of the levels were left out, Pascal prefers the safe course. However, you can factor out as many levels as you wish with a WITH statement. Say we specifically wanted to talk about the baby's birth time. We write:

```
WITH thisbaby DO BEGIN
  and all the statements up to a corresponding
  END
can refer to the field's day, hour and min by themselves.
```

Days as names, not numbers

To get back to the time record, let us consider the bit definitions in more detail. The first is a list of words. These are symbolic values which day can take on and are known as enumerated scalar type. Despite the long title, symbolic values are a very simple concept and a great aid to automatic documentation. For example, let us declare:

```
VAR clockon: time;
```

(that is, clockon is a variable of type time) for more readability for less error-prone to write:

```
IF clockon.day = mon THEN ...
```

than

```
IF clockon.day = 1 THEN ...
```

After all, there is no general agreement that Sunday is the seventh day; many people consider it the first, or it may be zero-th or sixth (if you like counting from zero). These symbolic values, then, leave the numbering to the machine and let the programmer say what he means instead of once again having to consult tables of conventions.

There are 24 hours in a day

Since this is a fact, we can make use of it to protect fields which hold hours by defining the appropriate subrange of numbers:

```
hour: 0..23
```

The effect of this statement of fact is fourfold:

1. Documentation is automatically enhanced.
2. Protection. Any attempt to assign anything outside 0..23 will be trapped and signalled as an error. The remarks field is that most of these errors are actually detected by the compiler at compile time. Thus, we have:
3. Speed. There is very little penalty attached to running programs "with checks on". In fact it has been shown that array bounds and array indices are declared over the subranges, as is normally the case, then programs run up to 10 times faster than those which do not use subranges. The reason is that the compiler can make deductions and verify that subscripts will not go out of range and therefore it does not need to generate the checks.
4. Space. If we want to save space when storing times, we can declare the record as PACKED RECORD:

```
TYPE time = PACKED RECORD
  day: (mon, tues, wed, thurs, fri, sat, sun);
  hour: 0..23;
  min: 0..59;
END;
```

It is now up to the compiler to calculate how much space the field needs and to squash them up as it sees fit. It may do this by packing the fields tightly as in Figure 1b, or by starting each on a boundary for faster access as in (c).

The point is that the programmer is not forced to work out exact number of bits or bytes a field needs: he just specifies values that must go there and the compiler does the rest. In fact, too, that the numbers are stored in binary, for most efficient computation.

Summary

Pascal provides data structuring facilities that enhance documentation, security, speed, and space. Some of these records, symbolic values, and subranges. To my mind, the subrange facility that is the simplest yet most powerful and error-free programming yet devised.

Part 3. Back to Grammar. We go back to basics to see how the Pascal is simply and economically described.

Pascal User's Group

THE best way of keeping track of Pascal implementations, applications, and other developments, is by joining the Pascal User's Group, which is headquartered at the University of Minnesota, Minneapolis. PUG is a worldwide group run by volunteers, and its main activity is the publication of Pascal News, which usually appears four times a year. PUG has a European node based at the University of Southampton, and also in the UK, Western and Central Europe. Anyone in the UK who wants to join the group should write to: Pascal User's Group, c/o The Computer Group, c/o The Department of Mathematics, University of Southampton, Southampton, SO9 5NH.

PERIPHERALS AND TERMINALS

Micros blur the boundaries

By Roger
Brady

THE incorporation of microprocessors into every aspect of computers has complicated the definition of peripherals and terminals from what was previously a very simple description, relating to the basic functions of input, output, storage, and transmission, to a complex network of distributed systems.

Modern peripherals and terminals may be small systems when offline from a controlling processor and yet merely perform peripheral functions when connected to it. Peripherals and terminals should thus be viewed according to the functions they perform.

Although for many years peripherals were specifically designed and capable of one function only, modern peripherals tend to be a more specialist application of a general system. The era of distributed processing began a lot more quickly than would have been expected five years ago.

The main peripheral functions are input, output and secondary storage, which when linked with the transmission function turn peripherals into terminals. The input functions can be considered in terms of punched devices (punched cards, paper tape), character recognition (OCR, OMR, MICR, etc), and keying (keyboards).

Output functions can be considered in terms of displaying and plotting both set characters and constructed figures (character and graphic displays, printers and graph plotters). Secondary storage is generally either serial access (magnetic tape), or random access (magnetic disc). Terminals in general usually have both input and output features, and often secondary storage as well.

While there is no doubt that cards and paper tape have been almost totally superseded by other methods for handling bulk input of data, both have advantages for input of small discrete quantities of data such as job control cards or students' programs.

OCR was originally hailed as the answer to bulk data preparation and input problems, by reading source documents directly. The cost of the complicated scanning and recognition electronics coupled with the increased use of distributed data entry terminals placed a severe restriction on the growth of this method.

The use of the LSI technique has enabled large fast character recognition systems to cater for both a wide range of fonts in the one document with a wide acceptable contrast range (due to the use of LSI photo-diode arrays), and allowed low cost systems (under £1,500) to be developed for use in such areas as word processing.

MICR tends to be restricted to banks, while OMR tends to be restricted to specialist publications such as market surveys, etc. Probably one of the most important developments has been the increasing use of barcodes and magnetically-encoded plastic cards for retail applications.

There are, of course, other input methods, such as pressure pad character recognition systems, which recognise the directions of different strokes drawn on the paper, and voice recognition systems, that have been in existence in a limited form for some years.

The king of the low and medium cost hard-copy output devices is undoubtedly the dot-matrix printer. However, it owes its success to the development of LSI electronics. The majority of these printers are microprocessor controlled, even the very low cost units costing a few hundred pounds.

This use of microprocessors can best be illustrated by the example of bi-directional printers where cheap miniaturised buffer storage and computerised control enable maximum effective printing to be obtained from a basically slow-speed serial printing device. Plug-in ROMs enable character sets to be changed easily. Modern electronics enables the number of moving parts to be kept to a minimum, increasing reliability and reducing cost.

The comb-printer is probably the most important development in the medium speed range, where the dot-matrix principle is used in a slightly different manner. The metal comb has one tooth for every character position across the paper, with a hammer for every tooth. The line of print is formed by horizontal oscillation of the comb, the hammers impinging on the teeth as appropriate, combined with the vertical movement of the paper by a stepping motor.

Other important developments of recent years is the daisy-wheel printer which has made word processing systems a reality. Its ability to produce formed-character printing of high quality in a variety of easily interchangeable type styles, with a method that is suited to electronic control, has ensured its success.

Non-impact printing methods have developed for both extremes of the market. Thermal printers, which form characters usually in a dot-matrix by a heating process on special paper, and etching type printers, which electrically erode the surface of a coated paper, are common at the lower end of the market, while electrostatic and laser printing systems have been developed at the very high speed (20,000 lpm) end of the printing spectrum. Ink-jet printing methods have advanced considerably over the past few years, tending towards methods of spraying minute droplets rather than a continuous stream of ink.

Computer output to microfilm continues to develop, if slower in development than other forms of output. The falling cost of electronics has enabled more versatile systems to be developed. Modern plotting systems, both pen and electrostatic, usually incorporate a variety of software routines in ROM, reducing the need for tedious user programming and control microelectronics to simplify mechanical movements.

Display systems, both character and graphical, have also felt the impact of microelectronics, and the dot-matrix principle has again been applied, with considerable effect to the generation of characters and graphic symbols. The incorporation of large amounts of semiconductor storage has enabled local refreshing to be used, reducing the overheads on the controlling processor.

Developments in secondary storage, like many other peripheral developments can be summarised as providing more in the same space. Magnetic tape has developed to provide packing densities of 6,250 bpi at the top end of the market, while audio cassettes are commonly used to provide storage of 50K characters per cassette in the small microcomputer market.

One modern development, which shows considerable promise as a compromise between the ruggedness of floppy discs and the fast access of cartridge discs, is the Winchester type unit which includes the moving head mechanism in the same environmentally sealed housing as the disc. This system allows the head assembly to be very much lighter than the retractable mechanism needed for a cartridge disc.

Microelectronics has again made a very significant contribution to disc storage in that controllers are very much smaller and have increased facilities. Floppy disc controllers are, in fact, available as single chips.

Mass storage systems developed for the large system user include the Ampex type system using video-width tape in a continuous reel and the IBM 3850 type system, which uses discrete lengths of wide tape mounted on automatically loadable cartridges.

Terminal systems have shown a definite trend over the past few years towards a universal terminal with a slight variation according to application, instead of the range of terminal types that were available in the past. It is, for example, possible to obtain display terminals with a printer incorporated in the same

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Mass storage systems developed for the large system user

Peripherals and terminals account for an increasing proportion of the total cost of computer systems as they become more versatile and sophisticated and the prices of processor and memory components continue to fall.

It is not surprising that the computers sector working party of the National Economic Development Organisation is increasingly concerned about the level of peripheral imports, which last year exceeded £250 million.

High capacity disc drives, for example, are not at present made in the UK, and, although most other types of peripheral are built here the volume of imports exceeds national production in most cases.

The use of microelectronics is enhancing the capabilities of peripherals and terminals and blurring the boundary between the peripheral and the host.

This special section on Peripherals and Terminals looks at some aspects of the market. Here a senior consultant at the National Computing Centre, Roger Brady, examines trends and developments.

• Turn to page 20

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Revolution on the disc drive scene

By David Shear

AFTER a quarter of a century of magnetic disc drives (the first IBM patents date from 1954), the OEM disc drive industry has now entered an era of major change. In a few years some aspects of the scene will be unrecognisable. In this article I have attempted to examine the demand of the market, the changes in the drive supply industry, and new products.

From the early '70s until a year ago, the disc drive scene was relatively stable, with little change in suppliers, products or technology. This period can generally be regarded as an era where market considerations

prompted the emergence of product developments.

The one major growth area was the floppy disc, which, starting in the mid-'70s, will reach a shipment level of over one million units during this year. The OEM market throughout this period was for floppy discs, 2315/5440 type cartridge discs, 2314 type disc pack drives and the newer 3330 type disc pack drives.

For readers not entirely familiar with IBM type numbers, used here as technology indicators, a short glossary is given in Table 1.

The pressure from the market

pushed drive capacity gradually upwards, so that 1.5 Mbyte drives were pushed to 3 Mbyte, then to 6 Mbyte and in some cases to 12 Mbyte, while prices remained relatively constant per drive. However, this was accomplished by pushing the established technologies further, rather than by revolutionary advances.

The two keys to the revolution that has just begun are the dramatic reduction in cost in computing power, and the establishment by IBM of the fixed media Winchester type technology. The advent of microprocessors in small, cheap busi-

ness systems has promoted the opening up of huge new markets for computers.

This market led first to the explosive growth in the supply of floppy discs, but the requirement for more storage to match the increased power of microprocessors, still at very low cost, is now leading to the emergence of a new class of fixed disc drives. These new low cost fixed discs, only made possible by Winchester technology, will help to satisfy this market.

Five manufacturers have announced fixed disc changes over the last year. At this year's NCC in New York about 15 new pro-

ducts of this sort were shown, most of them with the new 5 1/4 inch media. Already, fixed discs are capable of storing up to 20 Mbytes.

Obviously, as small scale computers experience this jump in price/performance, the storage requirements of larger computers must increase to protect their competitive position. This is happening in two ways.

New cartridge drives using 3330 technology and other advancements to improve bit and track density are appearing, but more revolutionary are the very high capacity fixed disc Winchester drives, which have started to proliferate over the past year.

One major problem that can occur, when such a large number of new drive types appear, is that of usability. Disc drives need controllers and a new drive with a non-standard interface cannot quickly be incorporated into a system. Drive designers are attempting to solve this problem by building more of the controller logic into the drive, thus simplifying the interfacing job, or by emulating an existing interface.

There is also pressure to remove some of the problems of disc control from the systems builder. By putting a microprocessor into a drive, not only can the drive electronics be simplified, but spare processing power can be used to format data, handle errors, perform

Magnetic peripherals are unlikely to be replaced by semiconductor storage for many years because the dramatic fall in the cost per bit of solid state memory is almost matched by dramatic improvements in the recording densities of disc drives.

In this article David Shear, product marketing manager with Data Recording Equipment, discusses some of the latest developments in disc technology.

by in-house manufacture. Large companies intending to be a major force in computing are busily acquiring in-house manufacturing capabilities, buying up marginally profitable peripheral manufacturers. Xerox is a prime example having bought disc manufacturers Shugart, Diablo and G comp.

Some single product line suppliers may survive in the short term by super efficiency and single-minded concentration on a limited market.

Others may survive by changing themselves into systems suppliers or by being absorbed into larger groups. Independent manufacturers in going fast and new compa-

Type	Disc type	Approximate capabilities	
		tpi	bpi
2314	Multi-platter pack	100	2200
2315	Front-loading cartridge	100	1100/2200
5440	Top-loading cartridge	100/200	1100/2200
3330	Multi-platter pack	200/400	4000/7000
Winchester	Fixed media	300/600	5000/11000

Table 1: A technical identification glossary.

diagnostic routines and other similar controller chores.

It is also possible to do some simple file handling so that the device becomes, in effect, a "storage computer."

As the power and speed of the microprocessor increase so do the possibilities for this storage computer, such as sophisticated data handling (searches, file updates, etc), and multiple device type handling. The latter is useful with Winchester drive types in allowing a cheap data dump unit to be incorporated for back-up purposes.

The changes just described are suitable for drive manufacturers because they can result in greater added value, but what about the systems builder? His interests are best served by obtaining the lowest possible cost for the item not manufacturable in-house, generally the drive mechanics and specialised analogue electronics. These opposing requirements are producing changes in the structure of the computer industry, when coupled with the continual downward pressure on costs.

To retain profit margins when prices are dropping, lower costs are necessary. In the disc drive industry this can be done either by technological innovation, or

are arising with innovative products, thus accelerating the death of older technologies.

One exception to a general trend is CDC which, by a combination of size, innovation and judicious joint ventures, such as the recently announced link-up with Data Recording Equipment, will ensure the continuation of a strong, independent peripherals sector.

A further factor which will undoubtedly contribute to the emergence of Japanese products. It is naive to assume that given the home base, which they now have, the Japanese do not have the in-depth experience and capability to launch a successful attack on a US-dominated market.

The new products which have been talking about for months into the fixed disc, Winchester area. The forerunners of these were the high (up to 80 Mbytes) capacity drives typified by the Memorex 601 and the MMD, which are now available from a large number of suppliers. Hot on their heels are the low cost, low capacity drives, such as the Shugart 10-90, offering between 10-90 Mbytes.

Turn to page 20



The Raytheon PT8100 display terminal, sold in the UK by Data Logic, can emulate all terminals used with major mainframes.

Growing value of host-independence

By David Bonny

THE growth of complex networks has created a need for terminals which are able to communicate with more than one make of host mainframe. Here, David Bonny, senior consultant with the terminal systems division of Data Logic, looks at some of the features required of a host-independent terminal and how they can be realised.

"HE 'host-independent terminal system' has played a vital role in the development of computer communications during the past few years... and its importance and value is likely to grow as we move more and more into the microprocessor age.

"Despite the fact that mainframe manufacturers and most minicomputer suppliers include video terminals in their ranges of peripheral devices, the need for a terminal system that can interact with a variety of host processors is well established.

At first these terminals were developed by independent manufacturers who realised that if they designed a terminal system that would attach to a variety of mainframes, they would be able to produce in large quantities and thereby reduce prices below those of the mainframe companies. This commonality also simplified logistics and maintenance requirements.

In the early days the biggest beneficiaries were users who had "slightly special requirements", the in-built flexibility required to emulate mainframe suppliers' terminals being used to meet individual customer needs. The large airline networks are good examples.

As the market developed, further major reasons for host-independent terminal systems became apparent. For example, some users have discovered the attractions of keeping online VDU systems unaltered during the change-over period from one mainframe to another.

Equally, large organisations frequently have more than one type of mainframe, and many more have a mixture of mainframe and minisystems. In these circumstances the ability to use a common terminal provides major benefits in training, maintenance, flexibility and purchasing.

Operating staff, their unions and O&M departments are all concerned about the choice of the best terminal. The possibility of using a standard operator interface for all systems can reduce the selection effect, and the associated negotiations, into one single exercise.

Equally, many applications are now relevant to different parts of an organisation and a single user may require access to different systems running on different host computers.

In a perfect world this requirement might be unnecessary, but in practice it is frequently impossible to avoid. For example the order processing system may run on a local mini, the sales history file inquiry on the mainframe, the sales forecasting on an in-house or bureau time sharing system, and the order acknowledgment could be produced on a word processing system.

How, then, are these benefits achieved? The basic connection between terminals and host processors is the well-defined international standard CCITT V24 medium interface.

In addition, there are four other areas that have to match the host: display format and character set; keyboard functions; terminal protocol (the interpretation of command data); and, communications protocol (the "hand-shaking").

These can all vary from host to host although the first requirement can largely be met by a 1320 character display of 24 lines of 80 characters and a standard UK character set.

The special keyboard functions are invariably related to the host protocol, leaving the major part of keyboard as standard. However, intelligent functions at the terminal increase the need for special keys.

Early video terminals had "hard-wired" logic and were therefore designed and built for a particular host. But the advent of the minicomputer made it viable to have a "soft control" controller. Specialised minis were used as powerful cluster controllers supporting a large number of displays and other peripherals.

The main functions such a system has to perform are provided by an appropriate software control system, supported by easily changed hardware variables such as modem adaptors and keyboards.

The flexibility is enormous. Straight emulation, intelligent terminal systems, distributed processing systems and shared logic word processing systems can all become available by simply having the appropriate peripherals and keyboards and then loading the required control software.

The basic emulator frequently only requires a low cost cassette drive for program loading. Furthermore a maintenance engineer can then load a diagnostic program to aid problem determination.

Equally, relatively simple amendments to the control software can meet users' specialised needs, and a standard software product can turn an emulator system into a powerful intelligent terminal, with full data entry and validation capabilities, while retaining the standard terminal protocol link to the host.

Frequently the cluster controller will also offer a wider range of peripherals than the standard terminal systems. Typical of these are card readers, fast line printers and a wider choice of aerial printers.

All hardware within the system is normally general purpose. Any that is particular to a given application, such as asynchronous or synchronous modem adaptors, or matrix (serial) or line (parallel) printer adaptors, will be fitted as required.

The terminal itself may be standard, but is likely to need tailoring to meet different screen formats. Keyboard differences, although slight, can be extremely important since this is the operator interface.

Therefore, although it is possible to produce a keyboard which has IBM 3270, ICL 7181, Univac V110/200, Honeywell 7700 or Burroughs TD 830 as subsets, the key layouts will not match.

This is not critical for new systems but identical layouts are desirable when expanding and replacing existing systems. This is achieved by the use of a number of layouts and a "programmable" keyboard which transmits internal codes which

are translated by a software table. This feature also enables tailoring to a user's individual requirements.

The continuing cost/performance improvements available through new technology is also being reflected in stand-alone terminals.

The original hard-wired versions were replaced first by microprogrammed logic and, more recently, by microprocessors. Control software is stored in PROMs (Programmable Read Only Memory) and can be changed to suit different needs.

It is also possible to load software into the terminal from the host — and if the terminals have local storage, it can also be loaded from there.

Thus we have the outline design for a new generation of terminal systems. Each terminal will have its own micro and be backed by a micro-based controller which will provide sharing of peripherals among the terminals.

So with modern terminals, it becomes possible to start with a system that performs in standard interactive mode to a

given host and then expand its capabilities by adding peripherals and different operating software as and when required.

Undoubtedly, the next generation of microprocessor-based systems will be more powerful and more flexible. Multiple communications channels will enable clusters to interact with more than one host; concurrent intelligent functions, such as word processing, data

entry and validation will become increasingly used.

The trend is clear: the increasingly powerful terminal will remain as the human/computer interface, becoming the "intelligent associate", a term first used at a recent address to Interface '79 given by J. Thomas Mnrkeley, President of Raytheon Data Systems. It will open the door into a new world of information processing and communications world.

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CW/8

PERIPHERALS AND TERMINALS

German printer cuts pages

INDIVIDUAL cut pages are delivered by the M78 Self Service printer shown here. Introduced to the UK market by Tally, the M78 is built in West Germany by Tally's sister company, Mannesmann-Prozisions-technik. One of its first applications is issuing tickets to Stuttgart train passengers.

According to Tally other applications areas for the M78 include airlines, shops, hotels, and banks. At an airport or station, for example, a traveller can press a key for information and receive it instantly in printed form.

The M78 comes with one 80-character buffer and can print bi-directionally at 200cps. It can accept a wide range of standard 8-bit parallel interfaces.

Stationery that can be printed on and out by the M78 includes real or fan folded paper with up to six parts and card as heavy as 250 grams per square centimetre. The paper transport can be tractor or friction.

The card or paper is cut inside the M78 by an optionally triggered roller pressing it against a blade. The ticket or form then appears from a slot in front of the printer.



An exchangeable tape transport

A SOLUTION to the problem of non-exchangeability of media presented by the growing line-up of 8-inch fixed media disc drives appearing on the market is offered by the Kennedy Co. in the form of the Model 640 cartridge tape transport. The 640 can be used as backup storage for an 8-inch drive and provides a maximum unformatted capacity of 17.3 Megabytes.

The 640 uses 3M-type DC 300 cartridge and comes with 4-track read-after-write recording heads. Performance features include a recording density of 6,400 bpi, a recording speed of 30 inches per second and a rewind and search speed of 90 ips. Kennedy quotes a data transfer rate of 192 KHz and points out that the 640 utilises a modified frequency modulation recording mode.

To reduce time-consuming rewind operations the 640 uses what Kennedy describes as a

"serpentine" recording technique in which adjacent tracks are recorded in opposite directions.

Since physical compactness is one of the most important selling features of 8-inch disc drives, Kennedy has kept the size of the 640 down to similar dimensions: it measures 8.36x4.5x4.5 inches. Price is \$900 in OEM quantities.

A wide assortment of 8-inch fixed media drives was shown at this year's National Computing Conference in New York last month, including models from Perter, BASF, Microfilm, International Memories and Kennedy itself.

Because the hard 8-inch discs they all employ are non-removable, the recording capacities and data transfer rates

achieved are far higher than on 8-inch floppy disc drives, while the amount of physical space occupied is no greater — size being a major consideration with small commercial and personal computing systems.

The one big drawback compared with floppy disc drives is that the media cannot be removed, so that some form of high-speed back-up storage is needed if the user files exceed the maximum capacity of the drive.

The Kennedy 7000 drive, for example, stores 12 Megabytes on two fixed 8-inch platters.

The drives from Perter and International Memories both have capacities of 20 Megabytes, while the BASF 6170 offers capacities ranging from eight to 24 Megabytes.

Blurred boundaries

From page 17

housing, rather than as a separate unit.

Many low priced terminals have multiple microprocessors incorporated, and most semiconductor manufacturers supply sets of chips for building a set of VDU electronics.

Micro-floppy discs are frequently incorporated in terminals, as are such facilities as data entry and programmatic communications facilities. The trend towards distributed systems will definitely continue and it has been forecast that peripherals will be high-level

language driven in the future. Another trend that will continue is the incorporation of self-test facilities, enabling the user to diagnose his own faults.

The move towards more complicated electronics, with the maximum reduction in module parts, will obviously escalate reduce maintenance and simplify construction. Peripherals will most certainly tend to become more like, as mentioned earlier, with variations according to application only.

Peripherals will tend towards small systems, rather than purely slave units, producing hierarchical structures in distributed systems.

Disc revolution

From page 18

for around \$1,200 in high quantities.

Real innovation has come to this latter area with physically small units using 8 inch discs, again in the 10-30 Mbytes range, and at \$1,000-\$1,200 prices. Front runners in the 8 inch disc race are expected to be IMI and

Microfilm in the US and Data Recording in Europe.

Capacities are already being increased to 120-160 Mbytes in the larger 14 inch disc units and the low cost 8 inch units are expected to quickly follow suit. IBM technology is already available to push fixed disc units up to 10,000 bpi and 700 bpi.

REPORTS FROM THE FOUNDATION

A framework for project management

WHEN a project "goes wrong" it is all too easy to blame the staff working on it at the time — like the unfortunate Greek messenger. The Ancient Greeks had the understandable, if irrational habit of executing the bearer of bad tidings.

So it is with computer projects — character assassination being the order of the day. The symptoms of failure in a project are late running, cost escalation and a feeling of being out of control. The causes are most commonly incorrect design — a business problem has been wrongly specified or an inappropriate technical solution has been implemented leading to re-working, inadequate planning and possibly poor programming.

But notice when the problems become identifiable. It is usually towards the end of the project, during system testing, and the people most active at the time are, of course, the programmers. As a result, a great deal of attention has been directed at improving programmer productivity, at improving the construction of programs and at making the programs easier to maintain; all laudable aims but getting nowhere near the root of the problem.

The problems began much earlier — possibly as the project was being set up. So before looking at the techniques of project management let us establish a framework which is likely to lead to success.

All our education and training suggests that the best way of ensuring success is to get a good start; but a good start on a systems project is almost always a slow start. Systems are run by people and the relationship is complex. As a result things are not always what they seem.

It is necessary to spend time understanding the real problem, and the work needs to be done by a senior and experienced analyst. Use your best staff for the initial investigations — never use trainees.

STRUCTURING PROJECT RESPONSIBILITIES

A computer system is not an end in itself. It only exists to support a business need. It follows that the line manager who is going to run the system must be involved in the design — in fact more than involved; committed to its success.

The user executive is a key appointment. He should be at director level and have line responsibility for the ongoing business system. His role is not full-time and he will delegate day-to-day involvement to members of his staff. He has, however, overall responsibility for the project, for ensuring that the business needs are correctly stated, and that the user department wholeheartedly supports the new system.

If a suitable user executive cannot be found, the project should be stopped. If nobody will sponsor it at this stage they are even less likely to do so later on when the going gets tough — as it does.

The project manager is the

full-time leader of the project. To be successful he needs to have a good technical knowledge, a sound business knowledge and be good at project management. Usually he is supplied by Management Services and it is up to the user executive to ensure any gaps in his business understanding are remedied.

However good the project manager, he always benefits from a second opinion. The job of the supervising manager is to provide such a second opinion.

ORGANISING THE PROJECT DEPARTMENT

A computer project requires a wide variety of skills: business analysis, systems design, systems analysis, programming, organisation and methods, work measurement, technical authorship, operations, training.

The project will also require more staff in the middle and end

comprehensive, allowing no gaps in the analysis; clear, uniform and unambiguous in application; enforced.

Setting standards of performance (which is what this is all about) is a key responsibility area for the head of department. He must think carefully before introducing them, because once introduced they must be enforced.

The corollary is obvious: if you are not prepared to enforce them there is no point in wasting time on a standards manual.

SELECTING THE RIGHT PROJECTS

What is the right size for a computer project? The question is not quite as silly as it may look at first sight — and there is an answer: Not much bigger than the last project we completed successfully.

Computer projects can be extremely complex and they

STAGES OF PROJECT DEVELOPMENT			
What to do		Survey the problem	
	Creative Phase		
How to do it		Evaluate Solutions	
Get it done		Specify in detail	
	Execution Phase		
		Program/Implement	

Figure 1.

than it did at the beginning. While we should strive for continuity we can see that team members will change during the life of the project. All this instability creates something of a man management problem, as by their nature people prefer a stable reporting environment.

The solution is to distinguish line management of the staff (pay and ratings, development and progression) from the project management (mixed skills to solve a particular problem).

ESTABLISHING CLEAR GROUND RULES

If we are to get high quality work we cannot have all the members of the project team inventing their own rules as they go along.

We need to identify the various activities that need to be done and make sure that we set about every one in the best possible way. Whatever the standards are for (writing programs, system testing, writing procedure manuals, survey reports etc) there are common aims.

The standard should be simple to understand and work

always demand a high degree of technical and management skill. As they grow in size, the complexity grows in a way that seems to be exponential.

There is another reason also for limiting their size. It is difficult to maintain enthusiasm and momentum for an interminably long project — and it could be by the time it is introduced it is no longer solving the right problem.

Experience suggests that most projects should show results within one year and even the most complex within two years. That is not to say that very large projects are never undertaken; but a large project should be broken up into sub-projects which can stand alone and demonstrate progressive achievement.

This idea of breaking up a large problem into a more manageable size is a key to success in project management.

It is not quite as easy as it looks, however. If the division of work is carried out badly there may be too much interaction between the components — instead of within them. Getting it wrong adds complexity instead of removing it.

UNDERSTANDING THE NATURE OF COMPUTER PROJECTS

Computer projects have a creative phase and an execution phase, and the two are very different. The creative phase, at the start, is concerned with identifying the problem to be solved and deciding on a good technical solution which meets the real business need. (See Figure 1.)

The execution phase, which follows, is all about getting the solution installed — detailed specifications, programming and implementation.

The creative start, surprisingly, may take almost as long (in elapsed time) as the execution, but it only involves one or two people (with rather special skills). The execution may involve a small army of people providing a very different management challenge.

There is a second way of looking at computer projects which is equally important. Is the system input-driven or output-driven? An output-driven system (eg, management reporting, stock control, sales statistics) is very much easier to manage. Files already exist giving the database; there is little impact on the way people work; it is low risk, even when things go wrong. Input-driven systems (eg, order processing, payroll, foreign exchange dealing) are substantially more difficult. Main files have to be set up and maintained; transaction files have to be set up and maintained; extensive control and error correction procedures are needed; reorganising and retraining of clerical staff is required; it is high risk, even when things go well.

A way of reducing the risk of project failure is to minimise the number of input-driven systems going live at one time.

CHOOSING THE PROJECT MANAGER

"Good management" in any sphere of activity seems to have three ingredients: technical ability, enough to be able to judge the quality of the work of subordinates; leadership ability, a desire and ability to get results; and conceptual thinking ability, able to take an objective stance, one step removed from the immediate problem.

Let us use this classification to see what qualities are required in our project manager. During the initial creative phase, technical ability means having a deep understanding of the business problem together with a good understanding of systems solutions. Leadership ability is not, in this context, a matter of project team management but rather of handling user directors and staff; the ability to disagree constructively.

During the execution phase of the project, the emphasis shifts. Technical ability means not only a sound computer knowledge but also an awareness of people and systems; the human interface and what can be achieved with a computer system. Leadership ability means giving out the right size tasks and

checking that they get done; a systematic recording of all agreements and meticulous attention to detail.

It is not often that all these qualities are found in one man; but if we are aware that they are needed we can build a more balanced management team. A project manager whose strength is attention to detail might best be supported by an experienced supervising manager who is good at forward planning.

Of all the qualities, giving out

the right size tasks and then checking that they get done is the one to prize most highly in a project manager.

The quality to avoid is lack of success. In this business people do not seem to learn by their mistakes.

So do not pander to your inattentive sense of fair play by giving him a second chance; give him a different job which he can do well and get another project manager. It is kinder and more realistic.

By Hamish Donaldson

This Computer Weekly series is based on reports made by the Butler Cox Foundation research group, which examines a variety of topics relating to the development and use of information technology.

This month's report has been researched by Hamish Donaldson, who is director responsible for banking services at Hill Samuel and Co. He joined Hill Samuel five years ago as manager, projects, and is the author of A Guide to the Successful Management of Computer Projects, a how-to-do-it guide which covers all aspects of computer project development.

The Butler Cox Foundation is a research group which examines major developments in its field — computers, telecommunications and office automation — on behalf of subscribing members.

The Foundation transmits its findings to members in three principal ways: as regular written reports, through management conferences and through professional and technical seminars.

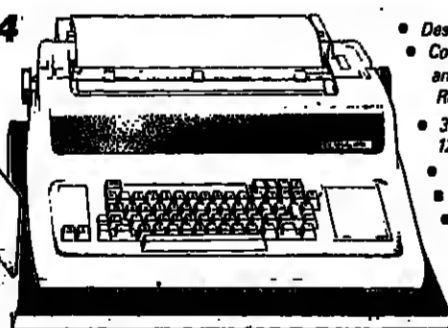


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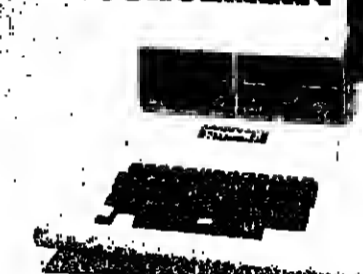
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BOOK REVIEW

Aims to teach well structured PL/I coding

Data structures and PL/I programming, by M. J. Augustein and A. M. Tenenbaum. 643 pp. £15.35. Prentice-Hall International, 66 Wood Lane End, Hemel Hempstead, Herts.

ONE of the most attractive features of PL/I is its versatility. More often than not, if one has a complex programming task to perform or some tricky data manipulation exercise to undertake, this language will provide a mechanism to enable one to overcome the difficulty.

Because of its comprehensiveness, manufacturers' manuals and textbooks devoted to it tend to be fairly voluminous renderings.

This present book by Augustein and Tenenbaum is no exception, and contains 630 pages of well-written easy to read text which is abundantly illustrated with a wealth of well-structured error free PL/I code.

The opening chapter deals with data structures and builds systematically from simple objects — such as numeric scalars, character strings and bit strings — through the various types of arrays to structures.

Having given the student an outline of the "simple" data objects that are available as primitives in the language, the authors continue in their second chapter by presenting an overview of programming in PL/I.

Here considerable emphasis is given to the use of good control structures — of which PL/I offers SELECT, DO...WHILE, DO...UNTIL, IF...THEN...ELSE, etc.—the need for good program structure and the techniques of achieving these goals from appropriately formulated algorithms.

These first two chapters will make extremely pleasant reading for a practitioner and would make appropriate reading for someone with programming experience and who wants to look at PL/I to see what it has to offer.

However, these chapters would not be of significant value to the novice in computing who has no prior knowledge of programming fundamentals.

Earlier chapters, having dispensed with the basic concepts of data structures, algorithms and programs, pave the way for later chapters dealing with the theory and implementation of stacks (Chapter 3), recursive processes (Chapter 4) and queues (Chapter 5).

The reader is introduced to the idea of dynamic storage allocation through the use of appropriate program structuring — BEGIN and PROCEDURE blocks — and via the ALLOCATE and FREE statements in Chapter 6.

These concepts form a solid foundation for the more advanced discussion

that takes place in subsequent chapters. Based storage and pointers are introduced in Chapter 6, entitled "PL/I List Processing."

Chapter 7 deals with trees and graphs — an area where the advanced data structuring facilities of PL/I enable the unhindered implementation of quite complex structures.

Tree creation — binary, threaded, homogeneous, heterogeneous, etc. — and traversal algorithms are presented along with their PL/I implementations and adequate illustrations of their practical applications.

The section of this chapter that deals with graphs and their applications is particularly interesting and presents some well-chosen examples that deal with flow problems and scheduling.

Sorting, searching and merging are probably some of the most frequently used computing/data processing operations. Their importance is reflected in this book by allocating two chapters to them — Chapter 8 to sorting and Chapter 9 to searching.

The chapter on sorting gives a concise taxonomy of sort methods, and a comprehensive coverage of the more important techniques such as radix, merge, address calculation, Shell, insertion, heap, tournament, bubble sort, quick sort, etc. The penultimate chapter is devoted to a study of searching techniques.

After covering the basic methods — sequential, index sequential, binary, etc. — there is a section on tree searching and updating; here, the advantages of balanced trees are presented along with algorithms for rebalancing them.

Examples of the use of digital search trees, forests and tries are also included. This chapter concludes with a detailed discussion of hashing techniques and some practical case studies.

The final chapter of the text is devoted to storage management from the point of view of the language/operating system implementation. Many of the problems associated with the allocation/freeing of storage are described and techniques for solving them are presented.

The reasons for garbage collection, thrashing, fragmentation, compaction, etc. are explained in lucid detail and many of the currently used storage management techniques — first fit, best fit, buddy system and boundary tag method — are outlined.

Each of the 10 chapters of the book contains a bibliography and reference section that enables the reader to follow up much of the detail of the material presented in the body of the chapter concerned.

Overall, the book has been well-thought out and produced to an extremely high standard. From cover

to cover the philosophy of the authors has tended to be towards presenting some theory and then following this up with illustrations in which PL/I has been the implementation language.

PL/I may be criticised by many purists and practitioners. However, these authors illustrate in a clear way that as a learning tool for the teaching of data processing it provides a very useful environment.

Indeed, it permits the use of adequate control structures, data structures and program structuring facilities. All of these are amply illustrated in this excellent textbook.

PHILIP BARKER

In-depth research dossier of a high editorial standard

Electronics: the Market in 1982, by Peter Evison. International Management Reports, Financial Times; £50. 125 pp.

THIS report is one in the series of Financial Times International Management Reports, which are in-depth research dossiers of a high editorial standard, especially commissioned by

Keeping up to date on DP developments

Selected essays in contemporary computing, edited by Alan Simpson. 222 pp. £5.25. Input Two-Nine Ltd, 7 Banstead Road, Purley, CR2 3ER. Tel: 01-688 6281.

ONE of the great problems in keeping up to date with the latest thoughts in DP is that the time lag between writing the manuscript and publication is relatively long. To combat this, the publishers have issued a series of books called "Current aspects of computer technology."

The publishers then list that some of the articles were of a wider significance and it is on this basis that the book was founded.

It is divided up into six sections. These are: 1. computer and society; 2. computers and education; 3. computers in the professions; 4. computers in industry; 5. computers and DP personnel; and 6. computers and communications.

Authors include CWT Micro Systems, which has been on the forefront of computer technology, the NCC's Patricia Hewitt on the impact of privacy; Kenneth Warren MP on governing the computer; Lorraine King of the BCS specialist group for the disabled on a profitable partnership between computers and the disabled; Ian Benson of Tass on the threat to jobs; Nigel Laurie of Communications Audit on interfacing man and machine; the NCC's George Peasey on training; Nick Bellard of the Society for Computers and Law on DP on an aid to the legal profession; IDPM secretary-general Ted Cliff discusses the DP profession; Dr Adrian Stokes of Hatfield Polytechnic on the designing of future networks; and John McNulty of Modular Technology.

CHRIS YUETT

Personal computing is coming of age

Do-it-yourself computing: the personal computer comes of age, edited by Martin Banks. Input Two-Nine Ltd, 7 Banstead Road, Purley, CR2 3ER. £9.95. (IDPM members £8.50.) 119 pp.

FEW areas of computer technology have "come of age" so dramatically as the personal computer. It hardly seems a year ago that "Do-it-Yourself" computing arrived.

Since then, the micro has made the industry a high standard. From cover

Exposé of making academic decisions

Choosing and managing information systems for public administration by Greame Norris and Wallace Ewart. £7.50. Saxon House, Teakfield Rd.

THE theme of the book, published in association with BP subsidiary Sclon, is an extensive, in-depth case study presented more as a teaching tool than text or training manual.

The area is an institute of higher education which is supposedly in the process of enhancing its DP facilities and incorporating the computer as a teaching aid.

The study, which forms the basis of a seminar, is certainly exhaustive. Proceedings are broken up into rounds complete with a dry-dish.

The academic nature of the study is emphasised by the DP managers' report which is heavily supported by advanced level algorithms.

Should such time-absorbing procedures be adopted by commercial establishments, a shameless and up-to-date decision could

be subject to several years' delay.

Rather off-putting is the format of the book, which is a style perhaps more suited to an A4 sized publication than a conventional book size.

Misprintings and typing errors abound and are in fact featured on both the front and last pages.

Is a second listing current machine types operating in UK universities, a reference code is given to large-scale IBM machines. There is, however, no related reference in the subsequent tables.

Midstream, the book suddenly takes a commercial break. Amidst the practical studies, there is a heavy promotion of Sclon with the suggestion that Sclon alone has expertise in offering consultancy in database technology.

However, the book does present for the dedicated reader a far-reaching "exposé" of decision making at academic level. As such it can be recommended.

ALAN SIMPSON

Growing threat to installations from Spooks

Spooks — the private use of secret agents, by Jim Houghan. £5.95. W. H. Allen, 44 Hill Street, London, W.1. Tel. 01-493 9471.

SPOOKS is not another item of our rapidly expanding computer jargon age. It is the title of a recently published book which, in a novel-like way, reveals the relationships of prominent people, organisations and contemporary events.

But "Spooks" is jargon; it is American slang for investigation and surveillance agencies. According to author Jim Houghan of this brilliantly researched 468 page report, our society has two histories, the public chronicle (the "Disney version") and a secret history, which has taken him four years to discover.

The US literary establishment which gave us "fac-

tion" writing or fictionalised facts also pioneered investigative writing or humanised facts, and Spooks is very people-oriented. It is packed with facts and characters, in a way comparable with a best-seller detective novel.

Even though it is not fiction, it is about the methods, motives, tools and systems of industrial spies and Mission Impossible agencies, who most often work for the highest bidders, the multi-nationals and organised crime syndicates with access to high technology.

The book's assessment of security risks by industrial espionage from Spooks to DP systems, chillingly suggests that the most threatening sort of computer system penetration is the one threat least likely to attract attention: intrusion designed to obtain information, without interfering with both data and the normal function of the computer system.

Significantly, for some years Douglas Aerospace, Univac and other major US manufacturers recognised the threat from Spooks. This includes eavesdroppers who have developed "high-noise" eavesdropping devices which can read a computer's contents by analysis of field-activity or electronic hum.

An even less publicised response to the Spooks comes from IBM which has invented the internal computer monitoring of environmental anomalies as a feature of the 370.

By backward-engineering techniques, IBM has also invented diagnostic and detective functions to counter ambient penetration with ring main telecommunications reporting.

Current state of the art research by ITT, Bell and RCA indicates that data-broadcasting systems pose a high security risk in transmission-booster stages, by both interception and overstepping.

The comment by IBM President Tom Watson that "IBM considers itself an extension of the US government" leads Houghan to suggest the mind-boggling possibility that the secret installation of "low-level" computers throughout the world could result in the installing of Spooks — where the computer itself may be the spy.

For the author has discovered that the user may not know of the "feedback" feature in the computer, and further reports support this suspicion by documenting a number of end-user certificate violations and abortive prosecutions in prime computer espionage exposures in Europe.

However, much of this sensation-packed book actually weaves a homely tangle, linking businessmen, politicians and criminals in networks of terrorism and illegality.

gratuitously emphasises weapons, sex and drugs. Jim Houghan's history of two adventures is credible and readable.

NEVILLE TAYLOR

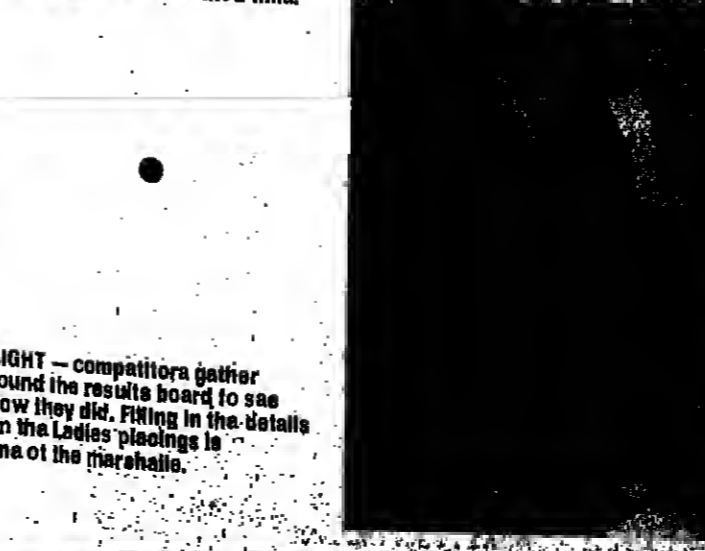
Gail is all set for double at Palace



Individual winner of the Ladies events was Case secretary Gail May. Gail, who is based at its Bradford office, finished on 81½ points.



LEFT — ready for the off in the Men's short sprint. The object is to clock up as many lengths across the track in a fixed time.



RIGHT — competitors gather round the results board to see how they did. FIVE in the Ladies' placings is one of the marshals.

SECRETARY Gail May stormed home to win the Individual events by a 9 points margin at the North Thames heat of Computastars on Saturday.

Gail, who works for Case's Bradford office, was last year's overall winner and this result must put her in a strong position to carry off a double this year.

Held at the Coptall Stadium, Barnet, the event ran with its now accustomed smoothness, despite a shortage of marshals. This led to an unusually large number of protests.

Case were helped into first position by Gail, who runs with Airedale and Spen Valley AC, thus stopping London Transport from scooping all the honours. LT were second and third in the Ladies team events and first in the Mens events, pipping Midland Bank by just three points.

In the Mens individual events, the margins were the tightest of the day with Midland Bank's Phil Bamgboye easing home over LT's Trevor Goodman by 1½ points, thus taking the trip to Crystal Palace in September.

The trophies were provided by Wright Air Conditioning who sponsored the competition in conjunction with Computer Weekly. They were presented by Wright's managing director Colin Brooke and his wife Sheila.

The Scandinavian Airlines team, who flew in specially from Copenhagen to compete in Computastars, came in sixth.

● The final of Computastars has been fixed for Saturday, September 20 at Crystal Palace. Admission is 80p for adults and 30p for children. Advance tickets guarantee spectators covered accommodation in the main stand and organiser Gordon Cairns hopes to run a slogan competition.

RESULTS

Ladies team events — 1. Case, 169½ points; 2. London Transport 1, 141; 3. London Transport 2, 136; 4. Lola; 5. Midland Bank; 6. Scandinavian Airlines System; 7. London Borough of Kensington & Chelsea; and, 8. Edwalton.

Ladies individual events — 1. Gail May, Case, 81½ points; 2. Lesley Wilson, Midland Bank, 52½; and, 3. Alyson Maund, London Transport, 42.

Mens team events — 1. London Transport, 132½ points; 2. Midland Bank, 129½; 3. Heinz, 120; 4. Gordon & Gotch 1, 113½; 5. CMC 1, 102½; 6. Lola; 7. Honeywell; 8. Blackwell's; and, 9. CMC II.

Mens individual events — 1. Phil Bamgboye, Midland Bank, 38 points; 2. Trevor Goodman, London Transport, 34½; and 3. Colgate, Gordon & Gotch 1, 30½.

TEAMS

Atlantic Computer Leasing Co, Blackwell's British Rail Case, CMC, Edwalton Distribution, Gordon &

Gotch, H. J. Heinz, Honeywell Information Systems, London Borough of Hammersmith, London Borough of Hounslow, London Borough of Kensington & Chelsea, London On-line Local Authorities (Lola), London Transport, Marcol Computer Services, Midland Bank (London), Robert Horn Computer Services, Roussel Laboratories, Scandinavian Airlines System, Smith Kilne & Franch, and Texaco.



Easing home by three points in the Mens team events was London Transport with 132½. They are: Fred Iles, Jeff Sney, Trevor Goodman and Ron Levin.



COMPUTASTARS

NORTH THAMES HEAT



ABOVE — the SAS team, who flew in specially from Copenhagen, ponder their fate in front of the main stand. The Ladies team finished sixth while the Mens' team was unplaced.



LEFT — Midland Bank's Phil Bamgboye eased home by a 1½ point margin over Trevor Goodman to take the Mens individual title and a trip to Crystal Palace.



Computer Weekly's best known race, Liz Rees of Case, took a break from appearing in her firm's adverts to run out for her team. Completing the glamorous line-up is Janet Hilton and Gail May, last year's winner.

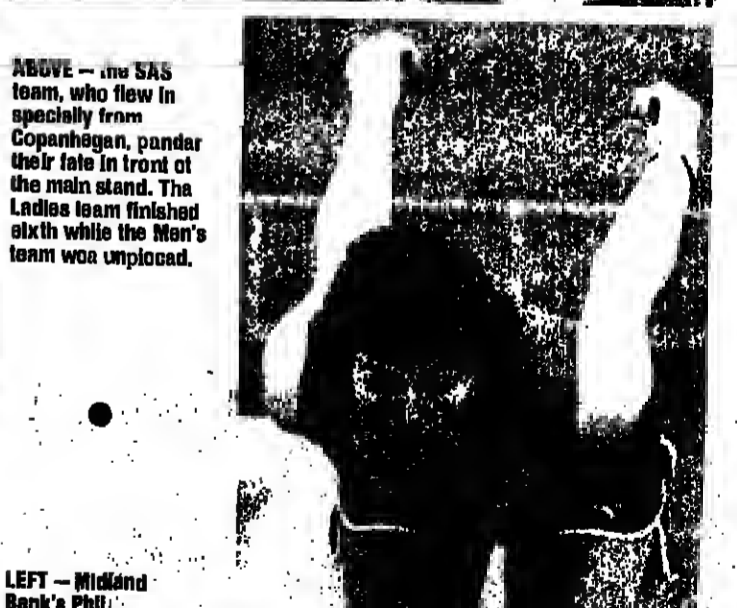


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William Key

COMPUTER WEEKLY, July 5, 1979

27

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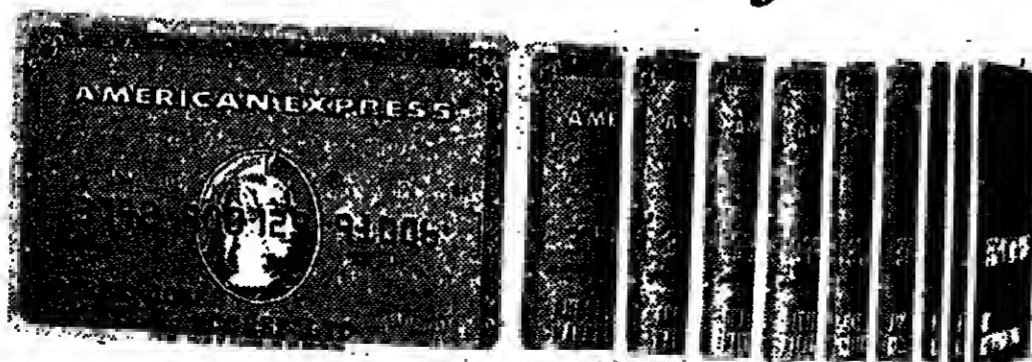
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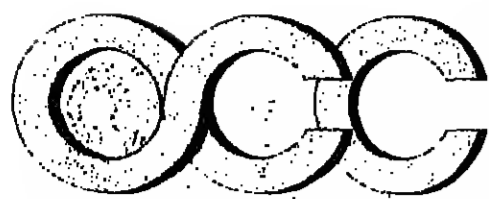
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Relocation expenses up to a maximum of £500 are payable, as is a separation allowance of up to £10 per week for married officers.



Application form and job description from Personnel Officer, Knowle, Sidmouth. Telephone Sidmouth 8551 (STD code 039 25). Closing date 20 July, 1979.

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Leeds

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LECTURER II IN COMPUTING

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Details from: The Services Officer, Leeds Polytechnic, 150-152, The Arcade, Leeds, LS1 3HE. Tel: 0532 48288. Closing date: July 24, 1979. Please enclose



TESCO is one of Britain's largest retail organisations. It's also Britain's fastest growing retail group, due in no small part to the effective way in which the company uses its massive computer complex. Because of this success and continuing expansion, we need to increase our computer staff. Right now, we are looking to slot in a number of new faces at our Head Office in Cheshunt.

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IIS & Program Products Analyst. Considerable experience of IBM's Interactive Instructional System (IIS) is essential as you will be the company's expert in its use; you will also examine other packages for use within the company, install and control them.

You will need in-depth design and programming experience, preferably with knowledge of on-line and database facilities to be able to advise development teams on security and on interface and restart/recovery procedures.

Acting in an advisory capacity to specialist project teams, you will need good all round experience of systems analysis, design and programming ideally including on-line and database background.

You will ideally have a Systems and Programming background and be required to train others with or without DP experience in Systems Analysis. You will be one of a highly skilled team specialising in training, with the opportunity to use Interactive Instructional System (IIS).

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Contact Fred Rayers, Computer Services Manager, Tesco Stores Ltd., Delamare Road, Cheshunt, Herts. EN8 9SL. Telephone: Walkham Cross 32222.

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Our client will train you in PL/I or RPG II if your last 18 months have been with any other high level commercial language. This opportunity is ideal for a young programmer looking to break into a "hands on," distributive processing environment.

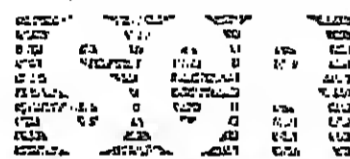
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You are not a boffin, you are creative and able to talk to all levels of users. You feel you have the ability to control a small team that you have selected. This is an ideal step into management.

You will be based in modern, elegantly designed premises working alongside enthusiastic staff, enjoying these benefits:

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Candidates should possess experience in either mechanical design or printed circuit board layout, together with some software knowledge. Familiarity with Data General RDOs would be an advantage.

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Locations, Edinburgh/Glasgow and Manchester. Applicants should possess several years' experience of computer system field maintenance and be capable of working on own initiative. Experience of plotting equipment and/or mini-computers would be an advantage.

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to act in a Project Manager role for systems implementation, and then to monitor and advise on the use of the operating systems and applications software. There will be considerable technical contact both with customers and our own engineers.

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JUNIOR SOFTWARE SUPPORT ENGINEER £4.5K - £5.5K + car allowance

to be responsible for activities relating to the provision of systems support to the customer base and our engineering staff, including involvement with product development, performance and testing exercises and specific monitoring of customer situations on site.

This career opportunity would ideally suit an HND student or someone with at least 1 year's experience in support/design software environment or computer operations.

All posts, based at Hemel Hempstead, are open to men and women, and offer a real opportunity to join a growing British computer company developing mini-computer systems in software and hardware. Salaries are negotiable according to experience and will also include a car allowance of £950 p.a. Excellent benefits and career prospects.

Please write, or telephone, for further details/application form to: Jim Parle, Personnel Officer, Computer Technology Ltd., Eaton Road, Hemel Hempstead, Herts. HP2 7EO. Tel: (0442) 3272.



The British Computer Systems and Services

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The present hardware consists of two ICL 2980's running under DME with magnetic tapes, discs and supporting numerous terminals. Operation is under George III with data drive, Communication Manager and TPS in regular use.

Applicants should preferably be

qualified to degree or equivalent level and should have at least 2 years computing experience. Fluency in the COBOL programming language is essential and a working knowledge of TPS and structured Programming Technique will also be advantageous.

Terms and conditions are those expected of a large organisation and include contributory superannuation scheme, sickness benefits and generous holidays.

Applications on form AF/1 obtainable by ringing Bristol 848236 (during office hours) or by writing to the Personnel Manager, Badminton Down, Bridgewater Road, Bristol BS13 8AN, to whom they should be returned quoting reference 408/79/CW: by not later than 24th July, 1979.

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North West

£16,000 + Car

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The product line is well proven and highly competitive both in respect of price and performance. Software is similarly well proven and the sales teams are extremely well supported technically on a local, regional, national and international basis.

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Candidates should have a first class record of successful selling mainframe systems or distributed networks. There are territories available both within specifically the manufacturing industries area and also the general commercial sales regions.

Excellent salary plus commission will give on target earnings c. £16,000. A car will be provided and relocation expenses reimbursed where appropriate.

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Ivor Norton Management Services Ltd Recruitment Consulting Division

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Position within SDL (UK) on return

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Scandinavia up to £16,000 package
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Applicants must have at least two years communications experience preferably on IBM equipment such as 3033, 3705, 4300 using SNA. As an alternative the company would consider candidates with a background of IBM Software e.g. MVS, CICS related to communication systems.
Excellent opportunity to work in Scandinavia on new technology projects.
Contact: Jim Baker

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- * **TECHNICAL CONSULTANTS** - with upwards of 5 years software design and implementation experience.
- * **SPECIALIST PROGRAMMER/ANALYSTS** - with between 3-5 years, preferably real-time software design experience.
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Above average salaries are offered, in a generous remuneration package which includes free life assurance, BUPA and non-contributory pension.

Contact: Andy Wright

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City Based to £7,000 neg.
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Contact: Margaret Stevens

For further information on any of the above vacancies, please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.
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16 Maddox Street, London W.1. Tel: 01-491 4478

INSURANCE COMPANY**Systems Analysts**

South of England

Salaries up to £16,000 + mortgage subsidy + non-contributory pension + free permanent health scheme + low interest loans + subsidised car hire and sports/entertainment + full relocation expenses + other benefits.
A very attractive prospect for career-minded individuals with a background in growth-oriented modern company patterned in the field of IP systems, promising exciting design and development work with the future.
We are keen to hear from Analysts who have a sound business background, a good knowledge of COBOL and experience of systems development in the three years, ideally in an accounting, financial or banking environment.
Contact: Mike Creamer

Programmers & Analyst/Progs.

South Midlands up to £6,500
We have been retained by a well known manufacturing organisation to recruit a number of Analyst/Programmers and Programmers to work on the development of commercial systems in a dynamic and expanding environment.

There are vacancies at several levels but all applicants must have a sound background of COBOL, on a mainframe, at least one year for the junior positions and three years for the more senior positions on mainframe applications preferably manufacturing, stock control or accounting.
This is a real opportunity to work in a friendly and professional installation. Salaries are negotiable according to experience. Relocation costs are available where appropriate.
Contact: Jim Baker

PDP 11/BASIC + Programmers

Mid-East Beds. to £6,000 p.a.
One of the few U.K. construction companies to have increased profitability over the past year, has two vacancies for experienced BASIC + programmers to join its busy and expanding department. The team consists of both an 11/60 and an 11/35 - the latter used almost entirely for development, with each technician having a dedicated workstation.
The D.P.M. believes strongly in giving its staff all round responsibility so once the successful candidates have proved their worth, complete projects are likely to be assigned.
Competitive salaries, regular merit and cost of living increases, a bonus scheme, "in-house" swimming pool and sports facilities, plus a pension all form a package well worth working for.
Contact: Andy Wright

McDowell, Knaggs

COMPUTER RECRUITMENT, TRAINING AND CONSULTANCY

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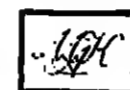
S. WALES, W. MIDLANDS

WHY ARE WE IN BUSINESS?

To get the right people to talk to the right employers. We are engaged in a large number of appointments and therefore are fully in touch with vacancies in our specialist geographic areas. We understand the sites as well as the jobs and are therefore in a good position to match both.

WHY SHOULD YOU READ THIS ADVERT?

Because there are 'n' hundreds of jobs advertised weekly in the computer and national press and it's quite a task to sort through them; on the first pass trying to understand what each ad is trying to say; on the second pass trying to evaluate the job in its entirety and finally trying to decide if it might be the one you are looking for - perhaps you are not looking specifically but are just interested in what's around. We have the advantage in that having talked to you (interactively) about your background and requirements, we can then map those on to the vacancies in the above areas - a far easier process (and with a higher hit rate chance) than trying to reply or even deciding whether to reply to a specific printed vacancy.



Phone now for an informal discussion or write to DDN KNAGGS on WORCS. 427077 (SEWLEY 400036 evenings, after 7 p.m. on w/e) at THE MOUNT, 1 ST. JOHNS, WORCESTER.

SENIOR PROGRAMMERS

Riyadh, Saudi Arabia

The Civil Service Bureau of the Government of Saudi Arabia has developed a computerised Personnel and Payroll Data Base System, to handle reports on salary administration, personnel motivations, education planning, placement selection and manpower development.

Successful applicants are expected to participate in implementing this System, as well as develop further Sub-Systems, using IBM 370/158 OS/VS, IMS.

Requirements: a minimum of:

- College degree in computing.
- Seven years' COBOL programming experience with the last three years in Data Base applications.

Benefits:

- Attractive salary depending upon qualification.
- 45 days' annual leave.
- Air travel for self and family.
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Correspond to (no later than Aug. 15, '79):

Director
Data Processing Dept.
Civil Service Bureau
Washim Street
Riyadh, Saudi Arabia

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(TRAIN TO ANALYST/PROGRAMMER)

VICTORIA SW1

to £6,500

A minimum of ONE YEAR'S RPG II experience could be your passport to SYSTEMS ANALYSIS training on this IBM System 34, which has Real-Time architecture and currently supports eight local terminals with a Remote terminal coming on-stream next month.

Our clients are internationally known end market leaders in their field. Current and future work includes both On-Line and Batch systems.

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Computer Personnel Consultants
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TAYLOR & WARD LTD

Systems Designers

Rural Kent

£8-10K

Relocation Expenses

+ Mortgage Assistance

Our client is part of a famous financial organisation with offices in the provinces and abroad.

Their principal office in Kent contains a sophisticated mainframe together with front end processors and links to a complex terminal network.

The company currently is developing large scale on-line and batch systems and is expanding its hardware so that new applications can be developed.

To spearhead these new developments they need to recruit two first class systems designers to develop the projects from feasibility through to implementation.

Ideally, candidates should be aged between 25 and 35 with a good academic background. It is essential that they have designed and implemented at least one major system in the financial/commercial sector and have had close user contact at all levels.

This is an ideal opportunity to join a really progressive company who are one step ahead of their competitors and with your assistance will keep this lead well into the 1980s and beyond.

To discuss these positions in more detail contact Yvonne Warren quoting ref. YW 2456.



Lloyd Chapman Associates

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Join a major Services Bureau which not only sells Timesharing services and business packages of all types, but also sells DEC oriented distributed processing systems. Vacancies exist in LONDON and the HOME COUNTIES for people with systems support experience to take TOTAL charge of existing clients and develop them. Basic salary between £4,500 and £6,500 for people with good Business Systems experience. Please apply now and enjoy a career with a real future. CW 27/1.

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to £8,500 + CAR C. LONDON
This major international terminal and mini manufacturer requires three freelance Systems Analysts to advise, design and install a variety of Real Time applications-based around Mini or D.E.M. Mainframe Computers. Excellent opportunity for advancement and top company perks. CW 27/2.

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Join a company really going places where over half their salesmen earned £18,000 last year. Their products are amongst the most advanced interactive DP systems in the world, having a nine-fold increase in performance across their range of CPUs. They also offer a very efficient range of compilers and operating systems. Vacancies exist in CENTRAL AND WEST LONDON, BERKSHIRE & MANCHESTER with basic salaries between £8,500 and £9,000. CW 27/3

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This successful European mini-computer manufacturer wishes to recruit first-rate salesmen to sell to the top 1,000 companies where their products have already made them world leaders. Basic salary will be £8,000 with generous commission and this is a really good deal for the right salesman with previous business systems or small machine experience. CW 27/4

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SALES AREAS - ALL OVER U.K.

One of the world's leading manufacturers and mini manufacturers have successfully launched a new range of small computers and is now seeking more salesmen to continue their tremendous success. Sales people need to have that motivation to sell in a commercial environment where rewards are there for the trying (a background in manufacturing or distributive trades is advantageous). Their range of complete also offers a variety of software plus total systems support from their excellent systems staff. Apply now and join the leaders. CW 27/5

COMPUTER SALESMAN

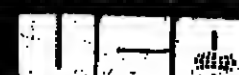
Q.E. £12,000+ PLUS CAR
S.E. ENGLAND

If you have a technical or commercial selling background with experience in the Petrochemical, R.D. University or Data Communications environments, then apply now to join one of the most successful independent mini manufacturers in the world. Their new 16 BIT and 32 BIT computers are technical innovators and sell from £7,000 to £260,000, covering every type of application. With an intensive marketing effort now in operation this company and you could really go places. CW 27/6

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Contract

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Experienced Programmer with a minimum of 3 years' FORTRAN on any machine. 6-month minimum contract, immediate start.

For further details contact:
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Applications Support Engineer - Europe

Computer Terminals

This important new appointment in our expanding terminal sales operation involves responsibility for providing our European Field Sales Team with technical and applications support for our range of printers and teleprinters. Other responsibilities will cover analytical and counselling support on technical matters for distributors and OEM customers throughout Europe, and ensuring that our products meet various Government and safety standards. The successful candidate will, however, be responsible for providing more than just a technical support function since he or she will be part of a strong selling team. An ability to demonstrate technical self-sufficiency and initiative is essential together with experience in one or more of the following computer related fields: data communications, computer peripheral line protocols, hand-shaking procedures and distributed DP, plus a working knowledge of hard and soft microprocessors. Although the appointment is based at the Company's head office in London, it will call for extensive travel in Europe and a working knowledge of French or German would, therefore, be useful, although not essential.



An excellent salary, terms and conditions will be offered.
Please send full career, education and personal details to Mrs. J. L. Standfield, Personnel Manager, Park Lane, 111 Park Road, London NW8 7JL.

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For application forms apply to:
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021-625 2251

We're successful because our staff are

Data Logic operates at the forefront of computing, applying the very latest hardware and techniques to practical commercial problems. We cover the range from mainframes to the smallest computers. We are leaders in the use of microprocessors for applications that not so long ago required far larger machines.

Many of the systems we supply go far beyond providing extra speed and cost savings. They will revolutionise the way the user organisations operate. Several projects involve dispersed networks of ten or more minicomputers. Our largest turnkey system incorporates twenty-three machines and close to three hundred display terminals across the country — a totally new system which will serve almost every function within a leading company. A new police contract involves the first use in the UK of a mini for a complex data retrieval

application — with our own advanced methods for rapid, generalised record searches.

The exceptional scope and quality of work is important to our staff. We can match their individual experience to their projects. Equally, we can ensure that each project adds to their experience. As computing itself develops, so do they.

Over the past year Data Logic has grown dramatically in size, in scope of work and in reputation. Our expansion has meant unrivalled opportunities for career progression. We are not prepared to promote people before they are ready for it. But when they are ready — and we give all the assistance we can — the positions as senior programmer, senior analyst, project manager and consultant will be there waiting for them.

The reason is simple. We know that we are successful only if our staff are.

Senior Software Staff

(Ref PS/32/CW) For mainframe, minicomputer and mixed processor systems, usually supporting terminal networks. Increasingly Data Logic's turnkey projects involve minicomputers at multiple sites.

Applicants must have at least five years experience including some work in consultancy, system design or team management. Substantial knowledge is required of either high level language implementation on a leading mainframe or assembler language development on DEC, Data General or other leading minicomputers. We are especially interested in experience of:

- database systems
- distributed systems
- data communications
- telemetry
- operating systems design and implementation.

Salaries will be highly competitive and a company car is provided to staff at senior team leader level or above.

There are vacancies at our Greenford, Birmingham and Manchester offices.

Programmers

(Ref PS/33/CW) For both mainframe and minicomputer projects which include commercial applications, monitoring and control, and scientific analysis.

Applicants should have at least 18 months programming and/or analysis experience in high-level language or assembler on any leading mainframe or minicomputer.

This is an outstanding opportunity to gain experience in the development of complex high performance software. Our programmers work in small teams, taking considerable responsibility for distinct areas of the total system.

Salaries will be highly competitive. Vacancies exist at our Greenford, Birmingham and Manchester offices.

Data Logic

Our profit sharing scheme ensures that staff benefit from the company success they create. Regular career appraisals provide a direct link between individual achievement and personal rewards.

Write or call, quoting the appropriate reference number.
Kathy Martin
Data Logic Limited
29 Marylebone Road
London NW1
01-486 7288

A Raytheon Company

Analysts Designers Programmers

Hampshire

Micro computer programmers, designers and software specialists with Assembler, Basic etc. to join an International Systems Group. Salaries £5-£8K.

Middlesex

A senior sales support analyst with a minimum of 6 years D.P. experience including Analysis, Project Management, Applications and operations. Initial software/Marketing training will be given in the U.S. The company is a Multi-national Manufacturer. Salary £8K +

Manchester

Analyst Programmers with 3-4 years real-time computer based automatic systems experience with an engineering degree or equivalent required by this U.S. Systems Group. Mini or Micro background is essential. Salaries to £9K + profit sharing.

Cheshire

Assembler/COBOL Programmers to join a team working on the design and implementation of our advanced integrated Database on-line banking system. ICL or UNIVAC main-frame experience preferred. Salaries £5-£7.5K + house purchase scheme + flexi-time.



Avon House, 360 Oxford St., London. W1N 9HA.
Tel: 01-491 4636 Telex: 28800 Londof G.

Hot Shot Assembler Programmers



Rural Kent

£5-7K

Relocation Expenses

Mortgage Assistance

- Do you want to work on exciting new software developments on a sophisticated mainframe using front end processors linked to a complex terminal network?
- Do you also want to develop your skills in on-line systems and data handling techniques?
- Can you produce good well documented Assembler programs and meet tight deadlines?
- Do you have 'A' levels or a degree and at least 18 months programming experience in Assembler? (A knowledge of COBOL would be an advantage).
- Do you want to work in a pleasant rural location with cheaper housing?
- If you can answer yes to all these questions and want to join a really progressive company who are one step ahead of their competitors contact Yvonne Warren quoting ref. YW 2457.



**Lloyd Chapman
Associates**

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PROGRAMMER with systems potential

We are looking for an experienced programmer interested in expanding his/her career into systems work.

The post will ideally suit someone with about two years' COBOL programming experience who is now looking for a wider job responsibility.

The job requires both the ability to work with minimum supervision and to communicate effectively with all levels of staff and management in an industrial environment.

The Company which is part of a major UK Group is entering the next phase of computer development. The person appointed will report direct to the D.P. Manager and the post offers both a high level of job interest and very attractive terms of employment.

Please write, giving details of experience, or telephone:
A. S. Langton, Recruitment Officer

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**BURROUGHS B1700 + B1800
I. OPERATOR 2. DATA CONTROLLER**
£6000 + excellent perks, 12 months of experience required by top company in West London.
Please ring Brian Pleskoff on: 074-7876
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CORBY DISTRICT COUNCIL

Programmer / Analyst

Salary £245 p.a. to £568 p.a. inclusive, with a pay award pending. Commencing salary will be dependent upon experience and qualification.

We are looking for a Programmer / Analyst with three to four years' computer experience, preferably in Local Government, and capable of playing a leading role in the development of non-financial systems for the Council. Consideration will be given to programmers wishing to extend into systems analysis.

The ICL 2903 equipment with F.E.D.S., Paper Tape and Card Input is at present under consideration for upgrading. The main language used is RPG 2, and although experience in this language would be an advantage the successful applicant if trained in other computer languages, would be sent on ICL conversion courses.

Relevant housing accommodation is available with a generous relocation package payable in appropriate cases. Further details and application forms are obtainable from the Personnel Section, Civic Centre, George Street, Corby, Northants, or telephone Corby 2561 Ext. 31.

Closing date: 20th July, 1979.

FIELD SERVICE ENGINEERS

£6,000 + choice of car + O/T + free BUPA + + +

Young, firmly established systems house in London, are planning further expansion and offer outstanding opportunities for ambitious Service Engineers. Burroughs VRC experience would be immediately valuable but the company is increasing its hardware range rapidly. If you have worked on any Mini or Micro computers you should still apply for this ground floor opportunity.

Choose your own car (limit £5,000), excellent financial package and superb career options. Ring now if you wish to be considered for interview. Consultation reference EK 2174.

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£10k+Appointments £10k+Appointments £10k+Appointments



\$30K+



General Foods Corporation is a \$5 Billion multi-national food processing group with plants in 15 countries and 100 locations coast-to-coast in North America. We employ 49,000 personnel. At the hub of this empire is our Information Services Division employing multiple IBM 370/158+168's, 3031, 3033 and 4331's. Advanced new applications under IMS DB/DC are beyond the planning stage and ready for development and implementation.

We are coming to the U.K. week commencing 16th July with a view to hiring experienced Analyst Programmers + Programmers on a 1-2 year contract commencing in early Autumn. We will expect you to be achieved IBM O.S. COBOL Programmers. Any IMS expertise will be highly valued and reflected in our offer. We pay generous overtime and fringe benefits commensurate with our size and standing - 23 million of our products are consumed daily.

Logistix, acting as Consultants will co-ordinate this hiring program and facilitate visas (very rapidly). Please contact them today to arrange an interview.

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UP TO £15,000

We specialise in real time, automatic and industrial control systems. We are looking for staff experienced in these fields who enjoy a challenge, take pride in their work and wish to join a dynamic systems company.

If you are interested, please write to:
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DAI

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We are a young dynamic and very professional company dealing in the Brokerage and Second User Market for IBM 370 range of computers and peripherals. We are currently looking for two Sales Executives who will be required to call upon IBM users in the UK and Europe and will report directly to the Sales Director.

Basic Qualifications — Enthusiasm, ability, self-motivation and above all someone whose not afraid of hard work. Knowledge of IBM computers and peripherals is absolutely essential. French and/or German is desirable as we are an international company and some overseas travel may be inevitable.

Rewards. Good basic salary plus high commission should generate earnings in excess of £15,000 per annum. Company car available after initial period. Excellent working conditions and all the usual benefits associated with a young company.

Interested parties should contact Stephen J. Measures, Sales Director.

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Telephone: 01-499 7955 or 01-491 4153

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MYRIAD

SOFTWARE & SYSTEMS DOS/VSE CREATIVE DEVELOPMENT

BERKS/BUCKS BORDERS

Successful people and organisations rarely achieve such prominence by accident. They share an enthusiastic drive and sense of purpose and have an ability to react to the market pressures of both an individual and company level. Our Client has achieved sustained growth and success by providing an environment in which professionals can rapidly develop to their greatest potential. A singular opportunity for success currently exists for a person with proven DOS/VS expertise to play a prominent role at the head of a creative software development team.

Joining a specialist software department the person appointed will lead small teams of technicians currently developing a range of advanced software products. Liaising closely with Technical Support and User areas to interpret requirements the successful candidate will participate in the design and specification of future software products in addition to identifying improvement potential in existing systems.

Applicants will offer over seven years' sound software experience coupled with an in-depth knowledge of Assembler and DOS operating system. They should be capable of working to high levels of achievement in a demanding environment requiring innovative and commercially practical solutions to systems development issues for which a dedicated range of 370 and 4331 equipment is currently installed on site.

To cope with the ever-increasing demand for its products and to maintain its unique position in the software field the Company has ambitious expansion plans, thus offering the person appointed considerable scope for career advancement. Successful candidates will receive full training in the Company's products and will be offered first-class conditions of employment and a commencing salary in the range of £9000-£11000. A company car will be provided and generous relocation expenses are available where appropriate.

Ref. S2/0507

MYRIAD APPOINTMENTS LIMITED

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(01-353 0981 24 HRS.

Have you considered working in Europe?



If you have a good IBM 370 background in Systems Programming, or TP/0B Applications Development, why not contact COS to find out more about Working in Europe. We especially want to hear from applicants for these current project needs:

370 ASSEMBLER TECHNICAL SUPPORT

We are seeking someone to provide technical support for an existing project team working in the Netherlands. Responsibilities will include trouble-shooting, giving technical advice and some assembler programming. As the applications are being developed on an IBM 370/158 running VS1 and MVS under VM you should have a good knowledge of OS and a minimum of two years assembler experience. As well as high rates of remuneration this assignment will provide an excellent opportunity to further extend your technical expertise.

SENIOR PROGRAMMER-PL/I

To apply for this position you should have at least 18 months PL/I experience, preferably in an OS environment. You will be joining the same project team as the Assembler Consultant (above) and your duties will include the enhancement and support of some specialist software written in PL/I. In addition to the technical interest the position offers substantial financial benefits and a very pleasant working environment.

PL/I/CICS DESIGNER/PROGRAMMER

To take on a new project for a DOS/VS client in Holland. You should have good knowledge of using PL/I with CICS and familiarity with a Database will be a benefit since the system uses TOTAL. This project offers a high degree of job interest as well as the financial advantages inherent in working on the Continent.

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To join one of our consultants who is already working with the above client's system support team. You should have a minimum of 18 months experience in supporting a DOS/VS system — familiarity with BAL and especially CICS/VS would be an asset. The position offers an excellent opportunity to broaden your knowledge of all aspects of system support in addition to the highly attractive earnings.

For further details contact Jim Shaw at COS, or on 0950 24546 evenings/weekends.



2 The Courtyard, Oermark Street,
Wokingham Berks. RG11 2BB.
Tel: (0734) 791225. Telex: 847317

UNIVERSITY OF SURREY COMPUTING UNIT

DEPUTY DIRECTOR

(Job ref. 10178)

During the summer this year the department is installing an integrated system of Inland Print computers — the most advanced and powerful multi-access Prime system in Europe.

A Deputy Director is required for the programme department and the successful applicant will deputise for the Head of Department for a wide variety of duties both inside and outside the University as appropriate. The Deputy will head in the running of the department and will be directly responsible for the management of the User Support Group which provides program advisory, information and teaching services, development of operating system software and libraries, and liaison with user projects particularly in computer-aided learning.

Candidates should have a lively and flexible attitude, proven management ability, wide experience in programming, and good academic and professional qualifications.

A negotiable salary on the Computer and Other Related Staff salary scales, extended £10175 per annum, plus generous annual leave.

Further particulars may be obtained from the Deputy Secretary (Personnel), University of Surrey, Guildford, Surrey GU2 5XH, or telephone 0509 71281, extension 452. Applications from men and women in the form of a curriculum vitae, including the names and addresses of three referees, should be sent to the same address by July 20, 1979.

£10K + APPOINTMENTS

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For further details contact:
Mark Williams on
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or
Mark Pulver on
01-281 8174

Systems Analysts/ Programmers

Sudan

US \$19,400 (after tax)

The Kenana Sugar Company Limited in central Sudan has developed into one of the world's largest irrigated sugar estates. The Company has installed two NCR 8250 computer systems using magnetic discs and VDU terminals for direct data entry. Systems currently under development cover stores, analysis of costs and payroll to be followed by analysis of expenses and assets. The work involves maintenance and modification of these systems and the development of new systems.

Experience — 3 years minimum with proven ability to design systems and write programs. Experience with the following will be an advantage: Cobol 74, multi programming environment, multiple on-line VDU terminals, financial accounts and asset systems, audit programs.

The working language is English.

Excellent conditions of service include:

- salary US \$19,400 plus 15% end of contract gratuity and discretionary incentive bonus all free of tax
- education allowances
- free fully furnished accommodation
- 60 days annual leave
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For an application form and for further details about the Company please write in confidence to David Prosser, Executive Selection Division, Southwark Towers, 22 London Bridge Street, London SE1 8SY, quoting MCS/8786.

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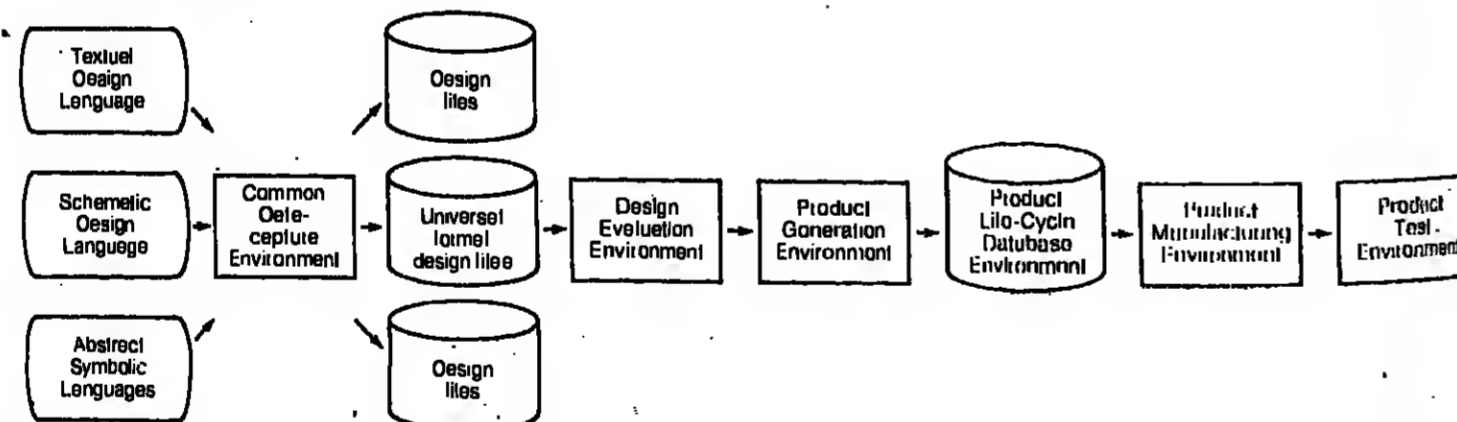
Bell-Northern Research has just embarked on the most advanced, total technology computer aided design and design automation system in the world. It's an ambitious program at our main Ottawa Laboratories. We need to fill immediate vacancies to complete our uniquely qualified team. These are, without question, exceptional opportunities for exceptional individuals.

As the project managers, you will be experienced, results-oriented professionals who can carry out bottom line responsibilities and motivate associates to achieve project goals. As software designers, you will be the type who can lead from the front technically, while determining future strategies for the evolution of design automation.

Your 5 to 10 years of solid experience, perhaps with a main-frame manufacturer, major software consultancy, or large industrial electronics firm will provide the background necessary for you to carry the project to completion.

The project

Here is the scope of our program. It is a total technology approach to the communications product development environment of the 1980's and beyond which includes the technologies of VLSI, LSI, thick film, PCB, firmware, software. It's unique in the world.



The Challenge

Make no mistake. This is a demanding program that will be a major milestone in your career. You will work in one of the following areas.

Design Languages
Hardware
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Data Capture Systems
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Design Evaluation Systems
Functional simulators
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Software animators
Analog circuit simulators
Statistical circuit design

Product Generation Systems
Chip layout design
PCB layout design
System software generation
Firmware generation

Life-Cycle Database Systems
Data manipulation languages
Database query languages
Database applications

Product Manufacturing Systems
Mask generation
Photoplot generation
Pascal-based compilers
Software construction systems

Product Test Systems
Test languages and methodologies
Automatic test generation
Hardware test systems

We'll be interviewing
soon
Come to see us about
your future

To find the software designers and managers we need, interviews will be held in London in early September. Spouses of selected candidates are cordially invited to attend an informal presentation which will cover all aspects of the Company activities and Canadian lifestyles. Interview expenses will be provided.

To arrange for an interview, we invite you to forward your detailed C.V. including home and business telephone numbers to:

Ron MacMeekin
Manager — Recruiting
c/o Dept. 994A
STOP # 7931
Government of Ontario
Ontario House, 13 Charles II St.
London, SW1Y 4QS

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OPERATIONS SUPERVISOR £5,500

A challenging position calling for complete supervisory skills and thorough knowledge of the NCR CRITERION or CENTURY range of computers.

OPERATOR c£4,200

Just 9 months involvement on NCR or any other mainframe would suffice for you to become the third operations member covering a 2-shift cycle. Daily deadlines are to be met so your job will be demanding but offers total job satisfaction.

For further details concerning either position, please phone Kay Stebbings on 01-240 2441 (reverse charges), quoting Ref. KLS9269/CV5/7.

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Further information may be obtained from either John Barrett (Director of Computer Services) or Personnel Department, NIHE, Limerick. Telephone: Limerick 43846.

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88

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Application forms and further details available from Personnel Officer, Civic Centre, Stourport-on-Severn, Worcs. DY13 8UJ. Telephone Stourport-on-Severn (0562) 77211 Extn. 80.

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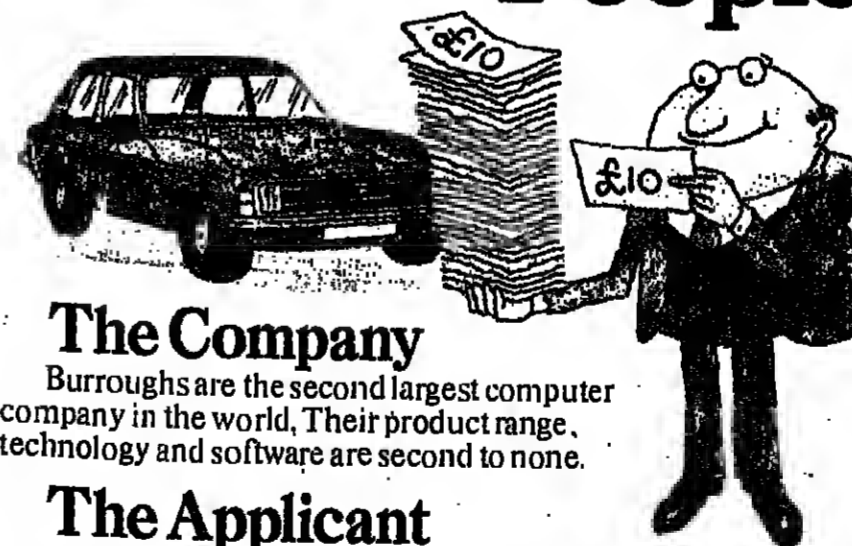
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DATA CONTROL CLERK

to £4850 WEST LONDON

A major brewery, based in West London and utilising twin ICL 2960's have vacancies for both a Senior and a Data Control Clerk.

The benefits, as one would expect from a company of this stature, are first class and include:

- four weeks holiday
- excellent restaurant
- new modern offices
- ample car parking
- free drinks - of course!

You will have upwards of one year's experience of controlling computer input/output and be capable of maintaining magnetic tape records.

A sociable shift pattern of 7.30 a.m. to 3.30 p.m. and 11.30 a.m. to 7.30 p.m. is worked on alternate weeks.

Interested, then for further information contact REX SCOONES at Croydon office. Ref. CW 158-9S

Positions open to male & female applicants.

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PROFESSIONAL
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CONSULTANTS



CAPP ASSOCIATES
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CROYDON, CR9 2AU

MYRIAD

ON-LINE TO CALIFORNIA

★ ANALYST/PROGRAMMERS
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Based in HAMMERSMITH, our client is a major international construction and engineering organisation with contracts world-wide. Computer development groups in London and San Francisco make extensive use of IBM 370 and Univac 1100 data processing facilities to provide a comprehensive range of systems covering all aspects of company management and administration. Systems development incorporates the use of database and time-sharing techniques and mini-computers with stand-alone or on-line capability are being used for distributed processing.

... will work in a project team on the development of database systems including Materials Control, Status of Equipment, and Project Management. Working within agreed time-scales the persons appointed will hold extensive analysis and design responsibility and should be able to offer a sound COBOL programming and systems analysis background. The successful candidates will be keen to gain or extend their knowledge of on-line, data-base and distributed processing and should show potential for future career progression.

★ TIMESHARING SPECIALISTS
£7000-£9000

Excellent conditions of employment include: company pension, free life assurance, paid overtime, flextime, L.V.s, and interest-free season-ticket loans.

... provide a two-fold service to U.K. users, in close liaison with the San Francisco D.P. centre and commercial bureaux. Responsibilities include assessment and evaluation of new timesharing products and applications, the provision of a consultancy to timeshare users in problem and fault resolution, and design of special one-off systems as required. The persons appointed will offer experience of either management or engineering applications and a knowledge of FORTRAN, BASIC or a high-level applications language in a relevant environment.

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y 1AA
01-353 0981 24 HRS.

DATA PROCESSING MANAGER

(NEW APPOINTMENT)

We are currently advising a market leader in the retail fashion industry on the appointment of a Data Processing Manager.

Our client has successfully used bureau services in the past and is now to install in-house facilities. The appointment offers a rare opportunity to plan, set-up and control the DP function in a rapidly expanding and profitable company.

We invite confidential enquiries from managers, supervisors and senior analyst staff with relevant experience and ambitions.

Location: North London.

Salary: to £10,000.

Other benefits include: subsidised BUPA and attractive employee discounts.

Forward resumés in strict confidence to:

DPSC GROUP LIMITED, International Management and Personnel Consultants, Crown House, Morden, Surrey, quoting reference AW1, or telephone 01-540 8311 (24-hour service) for a confidential assessment of the prospects.

**DP
SC**

DATA PROCESSING MANAGER

Aged 40-45

required for IBM System 34, due to be upgraded in the near future. Applicant will be responsible for running of DP Department together with the development of new systems. One to two years' RPG II experience desirable together with some knowledge of systems in a commercial environment.

Apply, stating age, experience and salary required, to:

B. DRAPER & SON LTD.
HURSLEY ROAD, CHANDLER'S FORD
Tel. Chandler's Ford 86355

SMR Sales & Marketing Recruiters Ltd

SALES EXECUTIVES

The most difficult thing in the world is to be objective about yourself. This is particularly relevant when considering a new job. It is hard to know what the alternatives are in the context of your existing experience and capabilities, possible career developments and potential employers, whether you are presently or potentially a salesman.

We are the only company in the Computer Industry providing sales training, market research, product promotion and sales recruitment services. We understand the problems. We are aware of the opportunities. We are the experts. **MR. TRADER SAYS SO!** With apologies to Rickenbacker.

Contact us anytime.

Tel: 01-734 9776

A Sales and Marketing Services Company

TRAINING, PROMOTION, RECRUITMENT

Full-time PROGRAMMER

for International Research into Dialysis and Kidney Transplantation.

The European Dialysis and Transplant Association requires a programmer with initiative and experience in FORTRAN and ALGOL to work at U.K. Transplant, Southmead Hospital, Bristol. An in-house DEC PDP11/34 and South Western Universities computer network is used. Salary in the range of £4,421 to £5,326 depending on age and experience. Supernutrition as for an NHS appointment.

Applications to Dr. A. J. Wing, EDTA, St. Thomas' Hospital, London, S.E.1. (Telephone: 01-633 0636) from whom a full job description is available.

Contract GERMANY COBOL PROGRAMMERS

We urgently require experienced Applications Programmers with IBM 370 COBOL background to work for 3 months in MUNICH.

For further details contact:

Bridget Kotchie

RENDECK LTD. 100 New Bond St.
London W1. Tel: 01-629 5438

Rendeck
Recruitment Consultants

**LANCHESTER POLYTECHNIC
AT
COVENTRY
COMPUTER CENTRE**
Due to the expansion of the Computer Centre and in order to prepare for the replacement of the current ICL 1903S computer there are vacancies for:

TEAM LEADERS
£5727-£8000 or £5727-£8242

SENIOR PROGRAMMER/ADVISERS
£5232-£5555 or £5727-£5800

**AND
PROGRAMMER/ADVISERS**
£4245-£5075

Applicants must have a degree or have a graduate equivalent status in mathematics, computer science or a related discipline. Have at least two years' post graduate experience (four years for the Team Leader post) at programming in a scientific, technological or commercial field, preferably in a variety of computer languages.

Interested applicants may contact Mr. K. Harrington, telephone Coventry (0203) 24186, Ext. 252, for informal discussions.

For application forms and job specifications please apply in writing, enclosing a large stamped and addressed envelope, to the Personnel Officer, Lanchester Polytechnic, Priory Street, Coventry, CV1 5FB, returnable by Monday, July 16, 1979.

PROGRAMMER REQUIRED

For expanding Structural Engineers in pleasant rural area producing portal frame buildings. Knowledge of 'Basic' language essential.

Salary negotiable, usual benefits, annual review.

Apply in writing to:
D. A. Green & Sons Ltd.
Whitby, Spalding, U.K.

£23
£23,000. Micro-coder with experience of AMO 2900 series (or similar) urgently required for long European contract. Please write to: Bexon on 01-963 4086 for details.

**Advance-
and be recognised**
Howard Organisation International Ltd.
Employment Business Section,
8 Estate Way, Borehamwood, Herts.

THE SALES AND MARKETING BIT

A CODE OF CONDUCT FOR PROFESSIONAL SALESMEN—PART 1

The way to preserve integrity in selling activities

A COUPLE of years ago I received through the offices of Computer Weekly's copy of a code of conduct issued by the British Computer Society asking for my comments and suggestions.

The fact is I never did receive an acknowledgement of my subsequent remarks. However, on several occasions since, I have thought it might be a good idea to publish my own version of a code of conduct for salesmen and ask readers of the Sales and Marketing Bit for their comments and opinions in order to finally produce a working document which could be passed to sales organisations throughout the industry as a basis for the formal code of professional behaviour for their selling staff.

So, over the next three weeks I would like to state my "30 Commandments for Professional Salesmen" and see how you react to them. There is an assumed code of practice among professional sales people which is based on common sense, integrity and the laws of the land.

While the number of occasions on which these unwritten rules are breached are few and far between it is important, particularly to those who are new to selling or involved in some related peripheral activity, that the behaviour expected of those involved in providing products and services for gain is formally declared to all people on either side of the buying and selling process.

Here are my thoughts on the basic rules which might be applied:

1. The salesman shall only promise and subsequently take on commitments to supply those products and/or services which his company is able to provide and has authorised him to sell in terms of price, performance and delivery.

2. The salesman will always act in a loyal and honest manner and openly declare his status as a representative of his company.

3. The salesman will never promise or give away any part of his commission earnings in order to solicit business.

4. The salesman will continually endeavour to sustain the immediate and ongoing satisfaction of the client on a basis of trust and good faith and to the best of his ability assist the client in achieving the lasting and profitable benefits of his investment.

5. The salesman will ensure that any contract between his client and his company is explicit, unambiguous and complete in such a way that it can subsequently continue to operate without undue hindrance should the involvement of either his direct contact or himself be terminated. Such an agreement will obey both the

spirit as well as the letter of any contract and of the law.

6. The salesman will use his best endeavours to ensure after-sales service/maintenance is provided, and at a reasonable frequency and price commensurate with the nature of the product provided.

7. The salesman will ensure that the client is aware of any additional work or expense he will incur by using the product or service he is being sold.

8. The salesman will make the client fully aware of any risks implicit in the purchase and use of the product being sold and any ways in which it might adversely affect his plans.

9. The salesman will ensure that the client has a complete understanding of the pricing of the product being sold and inform him of any impending price changes.

10. The salesman will inform the client of any positively known plans to withdraw or supersede the product being sold.

That's all for this week. I hope by the time this is finished in two weeks from now you will have generated some ideas of your own on what a code of conduct for salesmen should look like.

TRADER

Readers are invited to comment on the subjects discussed in Sales Bit, or to write about their own experiences in the market place. Letters should be addressed to Trader, Computer Weekly, Dorset House, Stamford Street, London, SE1 8LU.

ON THE MOVE

Seicon offices

NEW offices have been opened in Weymouth, Dorset, by Seicon Consultancy International. The location was chosen because it is ideally positioned to handle work from the Ministry of Defence, which now accounts for a significant proportion of this company's business. The new address is 43/44 St Mary's Street, Weymouth.

Fungus spreads

SPREADING through Europe, Fungus Computer Products now has a distributor in Portugal, Ditem Components-Electronic Ltd, Avenida Miguel Bamberda, in Lisbon. In another move to improve services to customers, Fungus has reached agreement with Billing Machines Ltd to pool resources instead of competing for the same market.

To Stockport

IN the north-west Gelcoo has moved its office to Regent House, Stockport. As well as sales and administration staff, the new premises house a customer education facility.

Puzzle Answer

THE clock face itself had been replaced with a dartboard. So at 12 o'clock the hour hand was pointing to 20.

201 1111

SYSTEMS ANALYSTS

c £8000

Sperry Gyroscope is a major defence systems contractor based in Bracknell, Berkshire.

Our Computer Services department has a long history of designing and implementing a wide variety of commercial application systems using onsite computers.

We are now designing a TOTAL database for implementation upon the UNIVAC VARIAN/800 to provide the users with online systems.

To accomplish this, we require 2 Systems Analysts with a minimum of 2 years' experience in a COBOL environment preferably with some online experience.

The Company offers an excellent benefits package including free life assurance, an up to date pension scheme and an active sports and social club. For further details and an application form, contact Stephanie Wansidge, Personnel Officer, Sperry Gyroscope, Downshire Way, Bracknell, Berks, RG12 1QL. Tel: Bracknell (0344) 3222. Quote ref. CW/5779.



Graduate plus two years?

If you have two years' computing experience now is the time to acquire some microprocessor expertise.

At Marconi Avionics we provide training in design techniques and CORAL. At plants in Borehamwood, Welwyn Garden City and Radlett, all in Hertfordshire, we are writing software for TEXAS, MOTOROLA and INTERSIL microprocessors and we need programmers and engineers for several small projects.

So if you are a graduate with two years' programming or hardware experience and are interested in working

with microprocessors please ring Chris Hill on 01-953 2030 ext. 3449. Alternatively write to him at Marconi Avionics Limited, Elstree Way, Borehamwood, Hertfordshire, or call 01-207 3455 (Day or Night), and we'll send you more information. Please quote reference MA79105. These posts are open to both men and women.

MARCONI AVIONICS
A GEC-Marconi Group company

COMMERCIAL ANALYST (Company car)

We have a vacancy in our head office in Cardiff for an experienced Commercial Analyst to assist in the development and implementation of systems on a new mini computer.

Applicants should be educated to degree level and should have at least five years data processing experience, preferably in a financial environment. A practical knowledge of management information systems is essential.

The position will involve some travelling to locations in Wales and the south west of England.

There are excellent opportunities for career development within the Bess group.

We offer a competitive salary, Company car, contributory Pension and Life Assurance Scheme, plus other benefits associated with a major company.

Applications in writing, stating age, experience and present salary to:

J. W. McCullough
Personnel Manager
Bess Wales & West Limited
Mansy-Coed Road, Llanllech
Cardiff
A member of the Bess Group



OPERATIONS STAFF

which combines the commercial- and scientific-oriented languages, Sr. programma, proclamation - pro, for, gramma, a letter.] progress, pro'gres, sometimes (esp. in U.S.) pro', n. forward movement: advance: continuation: advance to something better or higher in development: gain in proficiency: course: passage from place to place: a procession: a journey of state: a circuit. -v.t. progress' (formerly, as Shak., pro'), to go forward: to make progress: to go on, continue: to go in progress, in state. -v.t. (obs.) to traverse. -n. pro- (pra-, pro'- Greek) m.

Making Any?

It's a fact of life that many people are in jobs that offer them little chance of any real career progression. Progression into positions with more responsibility with the chance to gain valuable experience and, of course, better rewards.

You won't find that problem at Rank Xerox. Here at our International Data Centre in Bushey, Hertfordshire, we operate twin IBM 370/158's with RJE and interactive terminals and provide a wide range of timesharing and remote job entry system facilities.

Genuine expansion and recent internal promotion mean we now need to recruit career orientated men and women to fill the following key positions.

Supervisors £5700-£7000 inc. shift allowance

with a wide ranging operations and IBM background and experience of JCL, DP and OS/VS2. You will be involved in both Machine Room operations where you will be responsible for supervising Operators and controlling hardware

and Support Operations where you will act as a first line contact with users.

Operators

£4700-£5800 inc. shift allowance with 2 years experience on medium sized IBM systems with OS2 preferably higher level systems experience. Duties include monitoring our highly automated ASP system and supervising peripheral operators.

All positions involve working a 3 shift system and in addition to excellent career prospects, large company benefits include 4 weeks holiday, using 15, generous pension scheme and relocation expenses in certain cases.

Don't miss your chance to progress. Contact Denise Hicks for an application form at Rank Xerox Limited, Rank Xerox House, 338 Euston Road, London NW1 4BL. Tel: 01-307 1244.

RANK XEROX

The difference between a system that works and one that doesn't could be you

As an experienced operator, you're on the sharp end of the computing business. You know the difference between a suite of programs that will run smoothly and one that's going to create headaches.

At Sainsbury's, we could use your kind of experience. And we're ready to pay for it to the tune of around £5,600.

We're looking for a man or woman to help us get new and amended systems installed and working smoothly on our existing 1900s, and on our brand new dual 2970. Specifically, you'd be involved from the early stages of systems definition, and in specifying the groupings of programs into their operational jobs. Data security would also come under your sphere of activity, as would writing the job control language (George III and VME/8) and giving practical advice on system installation and testing.

At present, we see you as an operator who's concerned with the experience and training of our growing staff of operators, and as a person who'll be at the controls of our new dual 2970.

As well as the salary we've quoted, you'll have the chance to gain 2900 experience, and a general experience that could be your passport into operating management.

Lorraine Colthorpe will tell you more on 01-921 8047.

J. Sainsbury Ltd., Stamford House, Broomfield, London, SE1 1LL.

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set the standard



CICS SYSTEMS DESIGNERS c £NEG NORTHWEST

IBMS DATABASE ADMINISTRATORS .. c £NEG MIDLANDS

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CICS ANALYST/PROGRAMMER c £NEG NORTHWEST

HONEYWELL COBOL PROGRAMMERS .. c £220 NORTHWEST

UNIVAC 1100 COBOL ASSEMBLER PROGRAMMER £220 WEST COUNTRY, NORTHWEST

FOR DETAILS OF THESE AND OTHER CONTRACTS PLEASE CONTACT JUDY LEES/LYNN BARTON ON 061-833 9341/5 (24 HRS.)

143/144 ROYAL EXCHANGE BUILDINGS, MANCHESTER M22

OFFICES: LONDON, BIRMINGHAM, MANCHESTER, PARIS, AMSTERDAM, BRUSSELS
INTERNATIONAL DATA PROCESSING CONSULTANTS

Programmer

A firm of consulting engineers requires an applications programmer for the computing department of the head office in Westminster. The department provides technical programming, mathematical consultancy and data processing services to engineering teams and other departments. A Harris 5123 virtual memory system is currently being installed. CDC6600 and Cyber 175 computers are used on a bureau basis.

Work on a wide variety of projects is envisaged, demanding skills in problem definition, numerical analysis, simulation and computer graphics. A good degree in a numerate discipline is required with at least two years experience of programming, engineering or scientific applications in FORTRAN.

Apply in writing or telephone for an application form to:-

W. C. W. Hood,
BINNIE & PARTNERS,
Consulting Engineers,
Artillery Row, London SW1P 1RX.
01-222 7755 Ext. 307

ASSISTANT TO D.P. MANAGER IN SOMERSET

Company: Merritt Holdings. Equipment: ICL 2903-5.

Responsibilities: Day-to-day running of computer operations maintenance of existing system. Active involvement in future application.

Requirements: RPL II experience. Preferred ICL operations experience. Initiative and ability to take responsibility.

Salary: Negotiable by negotiation, including profit sharing. Merritt is a small and rapidly expanding company who are committed to an ambitious systems development programme, to include the use of communications facilities. Therefore successful applicant must have management experience and potential.

Applications, stating experience in writing to: C. J. Jackson, D.P. Manager, Merritt Holdings Limited, Mill Norton, Somerset.

Management Information Centre -Waltham Forest Practice

SENIOR LIAISON OFFICER AP3/4

The Information and Data section of the Management Information Centre requires a Senior Liaison Officer. This vacancy has been created by the appointment of a Senior Liaison Officer to Deputy Principal Information Officer in the Section. This section collects data from a variety of sources throughout the Polytechnic for the maintenance of various computerised record files on staff, students, applications, courses, etc. It also handles enquiries for information from a wide range of users, both internal and external. The person appointed will be responsible for a computerised file area and its related statistical analyses. He/she will also be expected to assist the other members of the section whenever necessary. A knowledge of data processing and computer file management programs, whilst preferable, is not essential, as any necessary training will be given.

The inclusive annual salary is on a scale ranging from £4033 to £4963 according to age, qualifications and experience. For further information and application form please contact the Personnel Office, North East London Polytechnic, 109 The Grove, Stratford, E15. Telephone 858 0811, ext. 32, quoting reference number A81/79. Closing date: July 20, 1979.

NELP North East London Polytechnic

METROPOLITAN Borough of Trafford Borough Treasurer Department

Data Based Administrator P.O.2 (1-5) (£7,044-£7,788 inclusive)

The Council operates an IBM 370-138 under DO5/VS. A variety of financial and other applications are using both On-Line and under batch processing and several applications are under development using RANIS 11.

Due to startling changes it is intended to appoint a data based administrator to spearhead the project to move into a full data base environment. A senior position within the computer section is offered together with responsibility for all aspects of data base planning, development and control.

The successful candidate will have the ability to motivate a team with drive and initiative and in addition to high level of expertise in systems analysis and design will be required to coordinate the staff fully to the success of the development programme. Experience in local government and/or data based systems would be advantageous.

Application forms and further information from Miss S. Dawson (Tel. 061-888 3181, Ext. 242). Completed forms should be returned to the Borough Treasurer, P.O. Box 10, Warburton House, 35-37 Washway Road, Sale M33 1AL, by 20th July.

OPERATIONS CONTROLLER

No shifts. Salary up to £6513 p.a. subject to review with effect 1st July, 1979 likely to be around £7000 p.a.

The person appointed will be responsible to the Data Processing Manager for the function of Mainframe Operations, the running of the T.P. Network, Data Entry and Data Control and will supervise a staff of 19.

Candidates, preferably aged 27+, must have previous supervisory experience and a good knowledge of ICL hardware and software (including GEORGE II).

The Corporation runs a twin 2906 configuration in a multi-programming mode under EXECS 4 on a 2 shift system.

As well as a competitive salary we offer flexible working hours, staff restaurant, social club, generous holidays, removal and other relocation expenses.

Application forms and job description are available from the Personnel Section, Civic Offices, Civic Centre, Reading or telephone Reading (0734) 85911, Ext. 2032. Closing date 23rd July, 1979.



READING
Borough Council

NEWCASTLE-UPON-TYNE POLYTECHNIC

Computer Unit

Requires applications for the following posts. The unit provides a computing service for the teaching, research and administrative work of the Polytechnic and is linked to an IBM 3081/2 mainframe and operates its own NOVA minicomputer terminal systems. A new multi-media system is currently being installed.

MANAGER (PRINCIPAL LECTURER)

To head the Programming and Advisory Services division and deliver an academic masters for the Director of Computing. Several years computing/teaching experience with degree level equivalent qualification required.

SENIOR SYSTEMS PROGRAMMER

To support a new database computing system. Experience of systems programming with degree level equivalent qualification required.

NJO Conditions: Manager: £7047-£7819 (inc. 1984 p.a. currently £7047-£7819 p.a. plus 21% superannuation). Senior Programmer: £5649 p.a. plus 21% superannuation. For further details and application form please contact the Personnel Office, Newcastle-upon-Tyne Polytechnic, Eldon Building, Eldon Place, Newcastle-upon-Tyne NE6 3ST.

Contract PL1 PROGRAMMER

Heavyweight PL1 Programmer with structured programming design and D.B. experience long contract starting mid-July.

For further details contact: Bridget Kitchie
RENDECK LTD, 100 New Bond St.
London W1. Tel: 01-629 5438



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